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Report of the
Bureau of Engineering
1939-1940

Department of Public Works
City and County of
San Francisco

JOHN J. CASEY
City Engineer

ANNUAL REPORT

OF THE

BUREAU *of* ENGINEERING

OF THE

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF
SAN FRANCISCO

FISCAL YEAR ENDED JUNE 30, 1940

ANGELO J. ROSSI	*Mayor*
ALFRED J. CLEARY	*Chief Administrative Officer*
A. D. WILDER	*Director of Public Works*

JOHN J. CASEY
City Engineer

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CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

ADDRESS ALL COMMUNICATIONS TO THE
CITY ENGINEER

IN YOUR REPLY, REFER TO FILE,

September 30, 1940

Mr. A. D. Wilder, Director
Department of Public Works
City and County of
San Francisco, California

Dear Sir:

Herewith I transmit the Annual Report of the Bureau of Engineering for the fiscal year ended June 30, 1940.

The Richmond-Sunset Sewage Treatment Plant was completed in April, 1939, and is now in operation. The plant treats domestic sewage from the residential areas of the western slope of the City, and is a unit of the long range sanitary program to eliminate pollution of the beaches and recreational areas along the shore waters of the Pacific Ocean and San Francisco Bay

Nineteenth Avenue from Lincoln Way to Sloat Boulevard has been completed. The work was done under four separate contracts. Construction on this project began October, 1938, and was completed in March, 1940. This Avenue is part of the State Highway system within the City.

Several major streets were improved by the reconstruction of roadways, moneys for which are derived from the state gasoline tax.

At the request of the Department of Public Health a sewage treatment plant was designed and built at the Hassler Health Home, located in San Mateo County.

Eleven sewer projects were under construction during the year, nine of which have been completed and two are nearing completion.

Yours respectfully,

John J. Casey
John J. Casey
City Engineer

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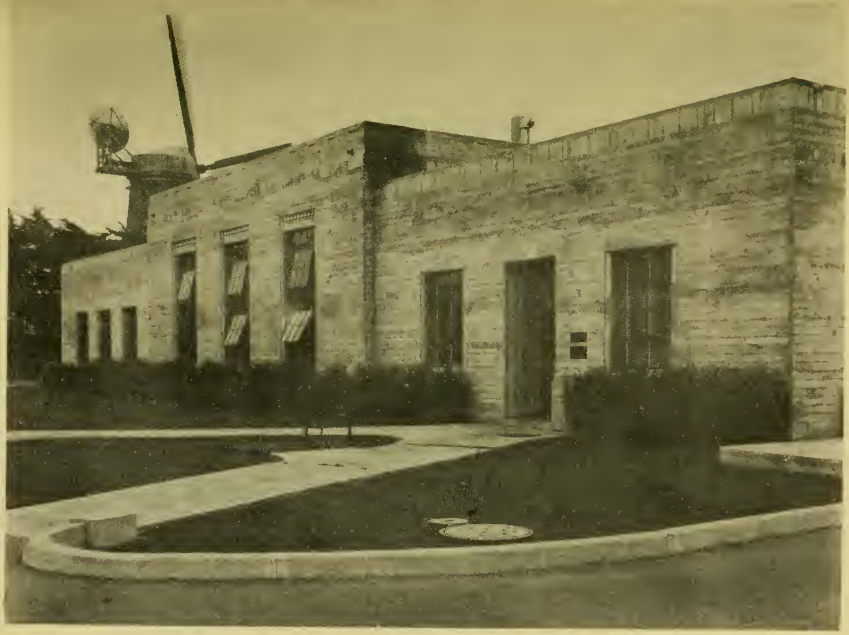
ORGANIZATION AND PERSONNEL

John J. Casey	City Engineer
C. E. Healy	Assistant City Engineer
S. P. Duckel Surveys, Street and Sewer Design and Construction, Street Assessments, Permits and Complaints	Engineer of Street Improvement Investigations
W. H. Ohmen Special City Projects, Boulevards, Sewers, Sewage Disposal, Bridges, Tunnels, Auxiliary Water Supply System, etc.	Chief Civil Engineering Designer
H. J. Stahle	Chief Surveyor
C. M. Taylor Supervising Construction (Major Projects)	Chief Civil Engineering Inspector
F. O. Shutts Supervising Construction (Minor Projects)	Chief Civil Engineering Inspector
L. Glick Contract Estimates and Payments, Personnel and Office Administration Records	Office Engineer
G. W. Purser	Traffic Engineer
B. Benas Richmond-Sunset Sewage Treatment Plant	Superintendent



RICHMOND-SUNSET SEWAGE TREATMENT PLANT
Administration Building

BOULEVARDS, STREETS, AND HIGHWAYS

BOULEVARD RECONSTRUCTION OUT OF BOND ISSUES

Nineteenth Avenue Extension

Nineteenth Avenue Extension, between Ocean Avenue and Junipero Serra Boulevard, was built in 1929. This extension passes over some very deep fills, and temporary pavement was constructed at the fill locations in anticipation of settlement. Subsidence levels were taken at regular intervals, and it was decided that these fills had settled sufficiently to receive a permanent type of pavement which consists of a concrete base 8 inches thick and a 2-inch asphaltic wearing surface. The 12-inch sewers, Y-branches, manholes, curbing, and concrete sidewalks were constructed. The work was done by contract and cost $29,464.

HIGHWAYS OUT OF STATE HIGHWAY TRUST FUNDS*

Nineteenth Avenue

Nineteenth Avenue, between Sloat Boulevard and Lincoln Way, has been widened and reconstructed. This project was started in October, 1938, and completed in March, 1940. The work was divided into four contracts of four blocks each, or a total length of 2.1 miles. This Avenue was widened from 70 feet to 100 feet, with two roadways, each 38 feet wide, separated by a raised center strip five feet wide and two 9'6" artificial stone sidewalks.

---

*First One-Quarter Cent Gasoline Tax

First Section -	Sloat Blvd. to Taraval St. Completed May 17, 1938 Contract price	$ 109,991
Second Section-	Lincoln Way to Lawton St. Completed February 9, 1938 Contract price	120,675
Third Section -	Lawton St. to Pacheco St. Completed April 22, 1940 Contract price	85,722
Fourth Section-	Pacheco St. to Taraval St. Completed April 24, 1940 Contract price	106,389
	Total cost - - - -	$ 422,777

NINETEENTH AVENUE
South of Rivera Street

MAJOR STREET RECONSTRUCTION OUT OF SPECIAL GASOLINE TAX STREET IMPROVEMENT FUND*

Post Street

Post Street, from Market Street to Taylor Street was reconstructed. The work consisted of removing and replacing the existing pavement and base including the removal of the car tracks. Curbs were reset and redressed. New storm drain cleanouts were built. The contract cost was $37,910.

POST STREET
Looking West from Stockton
Before Reconstruction

POST STREET
Looking West from Stockton
After Reconstruction

Ocean Avenue The roadway on Ocean Avenue from Alemany Boulevard to San Jose Avenue was reconstructed. Asphaltic concrete wearing surface was removed and replaced. Contract cost was $8,693.

El Camino Del Mar El Camino Del Mar roadway from 27th Avenue to Lake Street was reconstructed by removing and replacing portions of the existing wearing surface and binder. The entire roadway was covered with a 3/4" layer of emulsified asphaltic wearing surface. The contract cost was $4,225.

*Second One-Quarter Cent Gasoline Tax

IMPROVED UNDER PUBLIC CONTRACT BY ASSESSMENT DISTRICT

Athens Street

Athens Street, between Excelsior Avenue and Avalon Avenue, was improved by the construction of pavement, side sewers, catchbasins, concrete curbs, and sidewalks. Contract cost was $10,634 of which the City contributed $1204.

Congdon Street

Congdon Street, between Trumbull Street and Alemany Boulevard, construction included pavement, 12" sewer, side sewers, catchbasins, manholes, concrete curbs, and sidewalks. Contract cost was $4,081. The City contributed $2,142.

BOULEVARDS BY JOINT HIGHWAY DISTRICTS

District #9 Ocean Shore Boulevard

The section of Ocean Shore Boulevard from Waddell Beach to Davenport, a distance of 8.2 miles, which was started in November, 1938, was opened to traffic on September 9, 1939, and officially accepted by the State on October 17, 1939. This project was completed at a total cost of $382,700 which included the cost of right-of-way.

A contract for the section between Lake Lucerne and Tunitas, a distance of 8.8 miles, was awarded to N. M. Ball, January, 1940, at a bid price of $281.974.

In May, 1940, a contract was awarded to Campbell Construction Company of Sacramento at a bid price of $82,964, for the construction of two reinforced concrete bridges, one across the Pescadero Creek and the other across the San Gregorio Creek.

District #10
Junipero Serra
Boulevard
Extension

Works Projects Administration forces started work June 1, 1939, on that section of the Junipero Serra Boulevard from Cypress Lawn Cemetery to Sneath Road, a distance of 2.9 miles. The roadway excavation and drainage structures were practically completed on June 30, 1940.

JUNIPERO SERRA BOULEVARD EXTENSION
Station 180 + 10
Constructing Embankment Over Arch Culvert

IMPROVED UNDER PRIVATE CONTRACT

Several subdivisions were further developed during the year. Work was done on Geneva Heights Addition, Ocean View Terrace, and on McLaren Park Terrace, under private contracts.

Other private contracts were:

Alta Mar Way	Seal Rock Drive to Point Lobos Drive
Bowdoin Street	Felton Street to Burrows Street
Burlwood Drive	Lulu Alley, westerly
Bowdoin Street	Sweeny Street to Hale Street
Brussels Street	Ordway Street to Mansell Street
Berry Street	Second Street to Third Street
Charter Oak Avenue	North of Augusta Street
Caine Avenue	Ridge Lane, 112' S.E.
Desmond Avenue	Sunnydale Avenue to Visitacion Avenue
Dolores Terrace	170' east from Dolores Street
El Camino Del Mar	Seal Rock Drive to Point Lobos Avenue
46th Avenue	Geary Street to Point Lobos Avenue
Gorham Street	San Jose Avenue to Cayuga Avenue
Geneva Avenue	Howth Street to Westerly terminal
Los Palmos Drive	Lulu Alley, Easterly
Lulu Alley	Los Palmos Drive to Melrose Avenue
Los Palmos Drive	Lulu Alley, Westerly
Linda Street	18th Street to 19th Street
Lawton Street	42d Avenue to 43d Avenue
Melrose Avenue	Lulu Alley to Mangels Avenue
Mangels Avenue	Ridgewood Avenue to Brentwood Avenue
Melrose Avenue	Genessee Street to Mangels Avenue
Moraga Street	34th Avenue to 35th Avenue
Moraga Street	39th Avenue to 40th Avenue
Navajo Avenue	Delano Avenue, N. W.
Nahua Street	Delano Avenue to Mount Vernon Avenue
Oneida Avenue	Cayuga Avenue to Alemany Boulevard
Ocean View Terrace	Chester Avenue to Worcester Avenue
Point Lobos Avenue	Alta Mar Way to 47th Avenue
Pacheco Street	29th Avenue to 30th Avenue
Quintara Street	15th Avenue to 16th Avenue
Rivera Street	33d Avenue, 82'6" Easterly
Robin Hood Drive	Landsdale Avenue, 500' Easterly
Seal Rock Drive	El Camino Del Mar to 45th Avenue
17th Street	Bryant Street to York Street
32d Avenue	Moraga Street to Noriega Street
Teresita Boulevard	Foerster Street, Easterly
34th Avenue	Moraga Street to Noriega Street
35th Avenue	Moraga Street to Noriega Street
35th Avenue	Vicente Street to Wawona Street
38th Avenue	Lawton Street to Moraga Street
39th Avenue	Lawton Street to Moraga Street
35th Avenue	Wawona Street to Sloat Boulevard
31st Avenue	Moraga Street to Noriega Street
30th Avenue	Ortego Street to Pacheco Street
Wawona Street	34th Avenue to 36th Avenue
Wisconsin	18th Street to Mariposa Street

SEWERS

BOND SEWER CONSTRUCTION

Alemany Boulevard

In Alemany Boulevard, between Mission Street and Crescent Avenue, 6", 10", 12", and 18" vitrified clay pipe sewers and manholes were constructed. The contract price was $20,765.

Bayshore Boulevard

Bayshore Boulevard, between Waterloo Street and Helena Street, was improved by the construction of 12" and 18" vitrified clay pipe sewers and appurtenances, the greater part of the sewer being encased in concrete and supported on untreated timber piles. The contract cost was $22,611.

CURRENT CONSTRUCTION

Cayuga Avenue

Cayuga Avenue Sewer, between Greece Street and Seneca Avenue, was constructed of 8" vitrified clay pipe encased in concrete. Contract cost was $1,115.

Ingleside Sewer

The construction of Ingleside Sewer, between Junipero Serra Boulevard and Nineteenth Avenue Extension, included 4'6" circular reinforced concrete sewer, overflow structure, drop manhole, special manhole, and standard manhole. Contract cost was $11,650.

Lake Merced Sewer Trestle

The work at Lake Merced consisted of removing the existing trestle and constructing a new one of timber to support a 24" cast iron pipe sewer. The contract cost was $9659. The trestle is now 45% complete and will be finished in August, 1940.

TRAFFIC

During the year the Traffic Engineering Section investigated and reported on numerous complaints and suggestions concerning traffic coming from the general public and local improvement clubs, cooperated with the Police and other City departments when traffic problems were under consideration, and sent representatives to meetings and conventions of traffic safety organizations.

Among the regular duties of the Traffic Engineer are the supervision of traffic striping and pedestrian lane markings, and the installation and maintenance of signs of all types. The regular maintenance program of traffic striping and pedestrian lane markings was continued throughout the year. Two hundred seventy miles of lane-stripes and crosswalks at 955 intersections were painted, using 7,200 gallons of white traffic lacquer. Total cost, including labor and material, was $45,000.

Fifty flashing electric type "Stop" signs were installed at intersections where the standard reflector type had proved ineffective; 76 standard reflector type "Stop" signs were installed at intersections where they would give satisfactory control. One hundred thirty-seven warning, regulatory and guide signs were installed where needed throughout the City and in cooperation with the Police Department; two hundred seventy-nine parking restriction signs were installed as required by provisions of the Traffic Code. Total cost of installation was $5,000.

One hundred forty-eight street signs were installed, 346 repaired, and 1150 were painted. Cost was $10,000

Traffic and safety conditions were investigated at 68 intersections and improvements made by traffic painting and/or the installation of signs or control devices. At two intersections traffic signals were installed to give positive control over the movements of traffic. At Bayshore Boulevard and the County Line a new traffic island and beacon were installed.

Traffic counts were made at 37 intersections throughout the City. A study and investigation was made for the installation of parking meters in the downtown area.

SEWAGE DISPOSAL

Plans and specifications have been completed for the construction of a new sewage pumping station in the Seacliff residential district, comprising 93 acres, for a population of 2500. A contract has been awarded for the construction of this station at a bid price of $56,692 which will include the building, electrical and mechanical equipment, and appurtenances. When this station is put into operation it will remove the sewage pollution from Baker's Beach on the South Bay at the entrance to the Golden Gate, this beach being a popular recreation area which is well protected from heavy tides.

AUXILIARY WATER SUPPLY SYSTEM FOR FIRE PROTECTION

Plans, specifications, and estimates were prepared for alterations to the high pressure installations caused by reconstruction of streets and narrowing of sidewalks.

The maps, details of installations, and underground records are being brought up to date.

BRIDGES

Third St. Bridge over Channel St. Waterway

Miscellaneous steel work was cleaned, sandblasted, and painted. Contractor was R. P. Paoli Co. Cost, $1790.

Fourth Street Bridge

A new south fender was constructed; timberwork replaced where required; trolley arch removed; and counterweights rebalanced; defective steel work was replaced; a new air buffer installed; 180 tons of steel cleaned, sandblasted, and painted; a new switchboard installed; and all necessary electrical work, incidental to alteration of existing circuit wiring, navigation lights and conduits, was performed. The contractor, M. B. McGowan. Cost, $17,847.

Sixth Street Bridge

The decayed piles and fenders at center pier for swing span were replaced. The contractors, Healy-Tibbitts Construction Company. Cost, $5,476.

Islais Creek Bridge

All exposed and accessible steel existing below the underside of the deck pavement was cleaned, sand-blasted, and painted; a new air buffer furnished and installed; one air buffer reconditioned; and repairs were made to mechanical and electrical equipment. Contractors were Healy-Tibbitts Construction Company. Cost, $5,748.

HASSLER HEALTH HOME SEWAGE TREATMENT PLANT

The Bureau of Engineering, at the request of the Department of Public Health, designed and supervised the construction of a sewage treatment plant at the Hassler Health Home located on a 300-acre mountainous tract in San Mateo County.

The home is operated by the Department of Public Health as a sanitarium for tubercular patients.

The treatment plant will serve a future population of 600, with a maximum sanitary flow of 60,000 gallons per day.

INTERIOR OF IMHOFF TANKS

A gravity sewer was constructed from the Main Hospital Building Group to the treatment plant located near the Children's Building.

The treatment plant includes a sewage lift station for the Children's Building sewerage system, Imhoff Tank with super-structure, chlorination and sludge pump building and sludge drying beds.

The contract was awarded to A. E. Mangs & Associates at a contract price of $32,946. The contract was started on March 20, 1940, and will be completed in July, 1940.

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

The Richmond-Sunset Sewage Treatment Plant was placed in operation in April, 1939. This plant treats domestic sewage from approximately 150,000 tributary population to eliminate pollution along the Great Highway and the North Shore to Fort Point.

The plant processes include measuring of the influent and effluent, screening of the raw sewage by mechanically cleaned bar screens, removal of grit and grease in Imhoff type tanks, mechanical mixing and sedimentation, and chlorination of the incoming sewage for odor control and of the effluent for bacterial disinfection. The combined ground screenings, grease and sludge are concentrated, thickened and pumped to the digester. After digestion in a primary digester the sludge is washed by the Genter Elutriation Process and filtered by a vacuum filter.

Most of the plant was designed for an average sanitary flow of 15 M.G.D., but due to lack of funds some of the units had to be

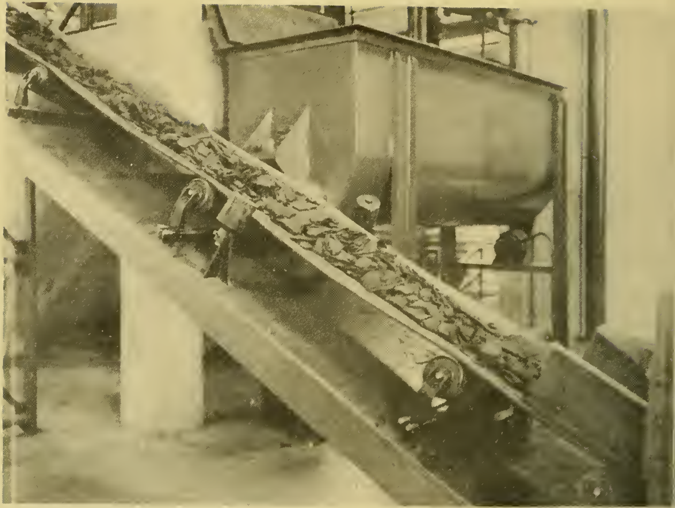
LABORATORY IN MAIN BUILDING

built equal to one-half of this quantity, principally the grit-grease and mixing sedimentation units.

There are two main areas, the Richmond and Sunset Districts, tributary to the Plant, both being sewered by combined systems. The Sunset District is only partially built up, the unbuilt areas are comprised mainly of sand dunes. During rains considerable quantities of sand get into the Sunset sewers. The main Sunset sewer carrying the flow to the Plant also serves as the outfall discharging the treated effluent to the ocean. Considering the quantity of flow and the amount of sand being carried, the Sunset sewage is by-passed during times of rain. The flow from the Richmond District is limited to 18 M.G.D. maximum by means of a special hydraulically operated control gate at the diversion structure located at 24th Avenue and Lake Street, and manual adjustment of stop planks at the plant.

The following tables show figures on the operation of the various Plant processes during the fiscal year of 1939-1940.

GRIT GREASE TANK
Pretreatment Building



FILTER CAKE CONVEYOR BELT
Main Building

SEDIMENTATION TANK
Showing Water Sprays in Operation

RICHMOND-SUNSET SEWAGE TREATMENT PLANT
COST OF OPERATION

Item of Expenditure	Total Plant Operation	Sewage Treatment Without Chlorination	Sewage Treatment With Chlorination	Sunset Pumping Plant	Sludge Disposal Conditioning & Filtration
Salaries (less truck operation)	$38,680	$20,300	$22,520	$8,540	$7,620
Contractual Services	5,286	3,730	3,850	574	862
Power	6,707	3,587	3,587	1,322	1,798
Gas	344	344	344	0	0
Chemicals	11,218	0	9,354	0	1,864
Materials and Supplies	4,673	3,465	3,622	350	701
Equipment	500	0	500	0	0
Hauling (truck operation including chauffeur)	2,617	261	523	916	1,178
Total*	$70,025	$31,687	$44,300	$11,702	$14,023
Cost per M.G.	$29	$13	$18	$5	$6

Richmond Flow - 1613 M.G.
Sunset Flow - 791 M.G.
Total Flow 2404

Cost per Capita $0.47

Additional Expenditures

Plant Improvements	$ 4,345
Office Engineering	5,461
Elutriation Patent	6,000
	$15,806

*The Sunset Pumping Plant and the Vacuum Filter were not operated at all schedule times due to shut-downs caused by repairs, changes, and cleaning for the Sunset pumps and sump, and to reduced load on digester due to decreased flow and load for the plant as a whole. In addition, the Sunset flow has to be by-passed during times of storm to prevent back-up in the storm sewers and to avoid large quantities of sand being brought into the sump.

TABLE 1 - FLOW AND PRE-TREATMENT DATA

Month	Flow M. G. Richmond	Flow M. G. Sunset	Flow M. G. Total	Screenings Cu. ft.	Grease Gallons Pumped	Sand Cu. Yds. Pre-Treatment	Sand Cu. Yds. Sunset	Chlorination Lbs. Pre	Chlorination Lbs. Post
July 1939	118.4	71.9	190.3	610	35,900	19	0	5,520	9,590
Aug.	93.2	56.8	150.0	445	23,200	4	0	4,400	8,130
Sept.	138.9	73.9	212.8	660	32,700	51	0	6,240	12,590
Oct.	145.4	51.3	196.7	715	32,400	57	0	5,860	10,960
Nov.	128.9	26.6	155.5	715	29,100	22	75	4,670	5,510
Dec.	111.5	25.7	137.2	510	23,700	23	105	4,120	6,490
Jan. 1940	151.1	28.8	179.9	580	29,200	67	81	5,400	7,560
Feb.	168.4	42.6	211.0	635	30,600	72	104	6,330	9,900
Mar.	173.7	69.8	243.5	690	34,500	75	153	7,310	16,210
Apr.	140.0	124.5	264.5	730	41,500	69	212	7,940	23,240
May	125.9	110.1	236.0	810	39,700	78	167	7,050	21,660
June	117.7	108.6	226.3	815	35,500	69	158	6,790	21,950
	1,613.1	790.6	2,403.7	7,915	388,000	606	1,055	71,630	153,790

The Richmond flow was by-passed two days and the Sunset flow 48 days because of rain. In addition the Richmond flow was by-passed 16 days and the Sunset flow 58 days for removal of sand from Sunset sump and flocculator tanks, mechanical repairs, and installation of new sand pump in Sunset sump.

Gallons of grease pumped is an approximate figure representing removals from the surface of the grit-grease tanks. Additional grease is removed from the influent channel to flocculating tanks, and some from the surface of the sedimentation tanks directly by skimming to pipes to the thickening tanks.

Pre-chlorination has been at the rate of 30 lbs. per M.G. continuously throughout the year.

Post-chlorination has been at the rate of 60 lbs. per M.G. from 2:00 A.M. to 8:00 A.M.; 80 lbs. per M.G. from 8:00 A.M. to 10:00 A.M.; 120 lbs. from 10:00 A.M. to 1:00 P.M.; 100 lbs. from 1:00 P.M. to 3:00 P.M.; 80 lbs. from 3:00 P.M. to 5:00 P.M.; and 100 lbs. from 5:00 P.M. to 2:00 A.M. During the month of December post-chlorination was used only on Saturdays, Sundays and holidays. Also, post-chlorination was not used during the times the Sunset flow was by-passed.

TABLE 2 - SLUDGE TO DIGESTER AND GAS PRODUCTION

Month	Raw Sludge To Digester Gallons	% Water	Lbs. Dry Solids	% Volatile	Lbs. Volatile	Gas Production Cu. Ft. To Boilers	To Waste	Total	Digester Temp. °F.
July 1939	1,538,400	97.52	320,400	79.9	256,000	1,424,300	1,332,600	2,756,900	94
Aug.	995,000	96.00	334,500	80.4	268,900	1,123,400	1,507,400	2,630,800	94
Sept.	1,438,700	95.55	537,800	80.2	431,300	742,800	2,733,500	3,476,300	87
Oct.	1,580,000	95.84	552,400	82.1	453,500	1,521,000	2,072,100	3,593,100	87
Nov.	1,391,600	95.97	470,500	83.7	393,800	1,394,600	867,700	2,262,300	94
Dec.	1,162,000	96.00	391,000	82.4	322,200	1,411,000	2,623,000	4,034,000	92
Jan. 1940	1,045,000	95.76	372,600	80.4	299,600	1,034,000	1,084,000	2,118,000	89
Feb.	1,114,800	95.55	416,400	80.6	335,600	1,378,000	2,019,000	3,397,000	89
Mar.	1,235,800	95.32	486,000	80.4	390,700	1,372,000	2,527,000	3,899,000	90
Apr.	1,462,000	95.65	534,700	81.8	437,400	1,266,000	1,918,000	3,184,000	90
May	1,552,700	95.48	589,600	80.4	474,000	1,308,000	3,252,000	4,560,000	90
June	1,794,000	95.71	647,600	81.9	530,400	1,331,000	2,935,000	4,266,000	89
	16,310,000	95.87	5,653,500	81.2	4,593,400	15,306,100	24,871,300	40,177,400	90

The sludge from the sedimentation tanks is discharged at intervals through sight-feeds to thickening tanks, allowed to settle by gravity without mechanism. The supernatant is pumped to the incoming channel to mixing tanks and the thicker sludge to the digester. The rate of withdrawal of sludge from the sedimentation tanks and the number of withdrawals depend upon the flow and strength of sewage, averaging about 10 withdrawals per day. Sludge is pumped to the digester approximately six times per day.

During the winter months the per cent volatile of the sludge decreases materially and the quantity removed is much less than during normal operation.

TABLE 3 - DIGESTED SLUDGE TO ELUTRIATION TANKS

Month	Supernatant Gallons	Bottom Gallons	Average % Water	Lbs. Dry Solids	Average % Volatile	Lbs. Volatile	Lbs. Solids to Elut. / Lbs. Solids to Dig.
July 1939	(a)	(b)	98.22		65.6		
Aug.	(a)	(b)	98.80		66.8		
Sept.	(a)	1,354,600	98.54	165,000	65.7	108,400	.31
Oct.	(a)	1,632,200	98.41	215,900	66.8	144,200	.39
Nov.	(a)	493.300	97.22	114,300	66.3	75,800	.24
Dec.	(a)	354,000	97,97	59,600	66.3	39,500	.15
Jan. 1940	*573,800	432,000	98.40	133,400	64.5	86,000	.36
Feb.	*758,800	366,000	98.52	138,000	64.5	89,000	.33
Mar.	*805,200	239,000	98.77	106,200	62.4	66,300	.24
Apr.	*1,007,400	463,000	98.53	179,200	61.7	110,600	.34
May	1,063,900	499,000	98.39	209,400	62.2	130,200	.36
June	1,358,500	431,000	98.62	205,700	63.4	130,400	.32

(a) No records available

(b) Sludge meter out of order

* Estimated

TABLE 4 - VACUUM FILTER OPERATION

Month	ELUTRIATED SLUDGE FILTERED Gallons x1000	% Water	Lbs. Solids x1000	Lbs. Fe Cl$_3$	% Fe Cl$_3$ on Solids	Hours Filter Operated	Lbs. Solids per Hour	Lbs. Solids per sq.ft. filter per hr.	Filter Cake % Water	Lbs. Cake x1000	Gallons Sludge Filtered per hr.	Lbs. Filtrate per hr. x1000	Cu. Yds. Cake to Park
1939													
July	300.0	96.79	81.3	3,170	3.90	100.0	830	4.15	70.8	282.1	3,000	22.4	218
Aug.	344.6	97.60	69.5	3,010	4.33	104.0	690	3.45	74.6	281.0	3,310	24.4	191
Sept.	502.9	97.46	107.6	4,040	3.75	130.0	850	4.25	71.8	391.8	3,870	29.1	291
Oct.	577.8	97.70	111.5	4,820	4.19	147.2	780	3.90	78.0	520.0	3,920	29.4	314
Nov.	250.8	97.24	58.2	2,540	4.35	65.0	920	4.60	77.9	270.5	3,860	28.2	171
Dec.	278.7	97.40	61.0	2,750	4.50	73.9	850	4.25	75.6	257.9	3,780	28.3	177
1940													
Jan.	306.6	97.10	74.7	3,300	4.42	81.2	950	4.75	75.5	312.9	3,780	27.9	219
Feb.	369.9	97.00	93.1	3,780	4.05	99.7	960	4.80	73.4	359.2	3,710	27.6	269
Mar.	346.0	97.08	83.3	3,870	4.55	94.4	930	4.65	73.9	335.7	3,670	27.3	255
Apr.	568.2	96.08	187.3	7,580	4.04	147.0	1320	6.60	75.4	785.2	3,860	27.3	569
May	515.1	95.60	190.9	8,080	4.24	152.2	1310	6.55	76.0	820.3	3,400	23.8	540
June	559.1	96.41	168.1	8,610	5.12	150.7	1170	5.85	76.1	725.6	3,710	26.4	526
	4,919.7	96.89	1,286.5	55,550	4.32	1,345.3	990	4.95	75.2	5,342.2	3,660	26.8	3,740

MARINA SEWAGE PUMPING STATION

The Marina Sewage Pumping Station was built to relieve the pollution of the shore line from Yacht Harbor to Fort Mason and also to improve the condition at Aquatic Park.

This pumping station serves Marina sewage district which is bounded on the north by San Francisco Bay, on the south by Clay Street, on the east by Jones Street, and on the west by the Presidio; it also takes a major portion of the sewage from the Presidio Military Reservation. The sewage is pumped, through a 30" diameter force main and gravity sewer, a distance of approximately two miles where it discharges into the Bay at North Point, the present point of discharge of the major part of the flow from the northeasterly section of the City.

The station is equipped with four 10" horizontal single-stage pumps, each rated at 4000 g.p.m. against a total dynamic head of 70 feet, with each pump being driven by a 440 volt, 3-phase, 60-cycle 100/60 H.P. motor at either 870 R.P.M. or 695 R.P.M.

In addition there is also one 10" horizontal single-stage pump rated at 2300 g.p.m. against a total dynamic head of 35 feet, and driven by a 440 volt 3-phase, 60-cycle, 30 H.P. motor at 870 R.P.M.

The station was designed and constructed to pump a storm run-off of .02"/hr. from the Marina District, in addition to the normal sanitary flow.

MARINA SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - 55,000 DISTRICT AREA - 1,025 ACRES

	PUMPAGE IN MILLION GALLONS:				Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day					
July 1939	112.8	3,698			21,110	$ 316.65	41.5	4,681	4.51
Aug.	120.6	3.954	No data		22,990	344,85		5,005	4.59
Sept.	115.8	3.797			21,100	316.50		4,806	4.40
Oct.	128.4	4.210	Available		23,340	350.10		5,329	4.38
Nov.	99.6	3.266			17,440	261.60		4,133	4.24
Dec.	103.2	3.384			19,560	293.40		4,283	4.58
Jan. 1940	126.0	4.131			24,470	367.05		5,229	4.68
Feb.	116.4	3.816			22,620	339.30		4,831	4.68
Mar.	149.4	4.898			29,250	438.75		6,200	4.71
Apr.	148.8	4.879			28,760	431.40		6,175	4.65
May	147.6	4.839			28,590	428.85		6,125	4.66
June	133.8	4.387			25,480	382.20		5,553	4.59
Total Per Year	1,502.4	4.105	(Daily (Average		284,710	$4,270.65		62,350	4.56 (Average)

69% Average overall efficiency of each pump and its motor.

COMMERCIAL STREET SEWAGE PUMPING STATION

The Commercial Street Pumping Station receives the sewage from the separate sanitary sewerage system serving the low level Yerba Buena Sewerage District which is bounded on the north by Market Street, on the south by Howard Street, on the east by Embarcadero, and on the west by Second Street.

The sewage is pumped through a force main into the North Point Main Sewer at Sansome and Commercial Streets.

The station is equipped with three 6" vertical single-stage pumps each rated at 1500 g.p.m. against a total dynamic head of 35 feet, with each pump being driven by a 220 volt, 3-phase, 60-cycle, 25 H.P. motor at 870 R.P.M.

COMMERCIAL STREET SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA - 92.5 ACRES

	PUMPAGE IN MILLION GALLONS:				Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day					
July 1939	10.62	.348	No data		2,010	$ 40.20	26.5	281.4	7.16
Aug.	9.00	.295			1,710	34.20		238.5	7.19
Sept.	11.00	.361	Available		2,090	41.80		291.5	7.17
Oct.	11.34	.372			2,150	43.00		300.5	7.16
Nov.	10.80	.354			2,050	41.00		286.2	7.17
Dec.	11.60	.380			2,200	44.00		307.4	7.17
Jan. 1940	15.20	.498			2,880	57.60		402.8	7.15
Feb.	13.40	.439			2,540	50.80		355.1	7.16
Mar.	13.14	.431			2,490	49.80		348.2	7.16
Apr.	12.85	.421			2,440	48.80		340.5	7.16
May	12.50	.410			2,370	47.40		331.3	7.17
June	10.98	.360			2,080	41.60		291.0	7.16
Total Per Year	142.4	.389 (Daily (Average			27,010	$540.20		3,774.	7.16 (Average)

44% Average overall efficiency of each pump and its motor.

VICENTE STREET SEWAGE PUMPING STATION

This station serves the Vicente Sewerage District, a low level area, which is bounded on the north by Santiago Street, on the south by Sloat Boulevard, on the east by Forty-fourth Avenue, and on the west by the Pacific Ocean. It also serves Fleishhacker Municipal Playground and Harding Municipal Golf Course. The station eliminates the pollution of a portion of the shore waters, commencing opposite Fleishhacker Pool and extending as far north as Santiago Street. This shore area is widely used for recreational purposes.

The sewage is pumped through a 10" force main which discharges into the Forty-seventh Avenue main sewer at Ulloa Street.

The station is equipped with two 6" vertical single stage sewage pumps, each pumping 900 g.p.m. against a total dynamic head of 55 feet, by a 230 volt, 3-phase, 60-cycle, 25 H.P. motor at 870 R.P.M.

CONTRIBUTING POPULATION - NO DATA AVAILABLE DISTRICT AREA - 51.4 ACRES

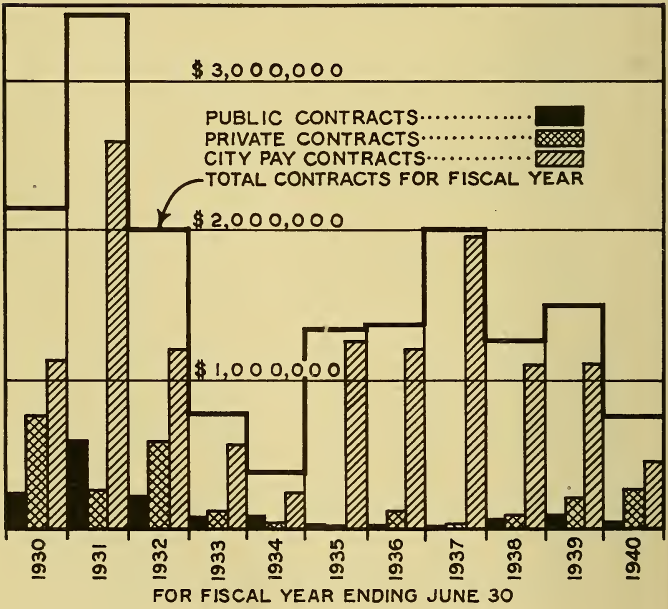
Month	PUMPAGE IN MILLION GALLONS: Total per Month	Daily aver-age	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1939	2.83	.093			1,060	$21.20	45	127.4	8.31
Aug.	2.25	.074	No data		840	16.80		101.3	8.30
Sept.	2.25	.074			840	16.80		101.3	8.30
Oct.	2.25	.074	Available		840	16.80		101.3	8.30
Nov.	3.75	.123			1,400	28.00		168.8	8.31
Dec.	4.75	.156			1,770	35.40		213.8	8.30
Jan. 1940	5.75	.189			2,150	43.00		258.8	8.32
Feb.	7.46	.245			2,790	55.80		335.7	8.33
Mar.	6.80	.223			2,540	50.80		306.0	8.31
Apr.	6.91	.227			2,580	51.60		311.0	8.30
May	7.50	.246			2,800	56.00		337.5	8.31
June	6.58	.216			2,420	48.40		291.1	8.32
Total Per Year	59.1	.162 (Daily (Average			22,030	$440.60		2,654	8.31 (Average)

38% Average overall efficiency of each pump and its motor.

WORK PERFORMED UNDER CONTRACT

Sewers		$ 125,384.00
Bridges		30,863.00
Boulevards and Streets		
Paid by City	$ 289,294	
Public Assessment	34,430	
Private Contract	251,766	575,490.00
		$ 731,737.00

STREET WORK PERFORMED UNDER CONTRACT 1930 TO 1940 INCLUSIVE



STREET IMPROVEMENT ASSESSMENTS, ETC.

ASSESSMENTS AND BONDS FOR STREET WORK

Assessments issued for cost of street work performed	10
Cost of street improvements covered by assessments	$42,464.50
Bonds prepared (in triplicate)	100
Amount of assessments guaranteed by bonds	$15,509.27
Average amount guaranteed by each bond	$155.09
Receipts for bond payments issued	449
Amount of bond payments collected	$19,659.65

STREET WORK PROCEEDINGS

Resolutions of Intention passed	27
Street improvements recommended under Resolution of Intention	21
Notices of Street Improvement posted	479
Notices of Resolution of Intention mailed	681
Ordinances ordering performance of street improvements passed	20
Proposals for street improvements published	23
Awards of Contract for street improvements published	16
Private contracts granted	51

NOTICES, PERMITS, AND INVESTIGATIONS

Notices to construct or repair sidewalks	2894
Notices to construct bulkheads	63
Notices to remove obstructions	447
Notices to obtain curb lowering permits	138

NOTICES, PERMITS, AND INVESTIGATIONS - Continued

Notices to construct guard rails	8
Notices to obtain oil tank permits	12
Notices to replace side sewer trap covers	72
Notices to obtain street space permits	384
Street space permits reported on	1458
Oil tank permits reported on	40
House moving permits reported on	33
Miscellaneous calls and investigations	4692
Blasting bonds set and jobs supervised	5
Curb lowering permits	1480
Notices to reconstruct area walls, set back side sewer traps and oil tanks and reconstruct sidewalk doors in connection with the widening of the roadways of streets by reducing the sidewalk widths	1143

PERMITS AND FEES FOR CORPORATION TRENCHES

	Permits	Lin. Ft.	Fees
Pacific Gas & Electric Co.	3,526	111,442	$5,448.00
San Francisco Water Department	5,138	7,896	7,768.50
Pacific Tel. & Tel. Co.	394	39,883	822.00
Postal Telegraph Co.	-	-	-
Western Union	4	-	6

SPECIAL PERMITS

	Number	Fees
Oil Tanks	14	$ 43.50
Curb Lowering	1285	4,768.50
Street Space	1459	12,500.50
House Moving	33	66.00
Sub-sidewalk	-	-
Oil Tank Permits Reported on	40	-

DIVISION OF GRADES

Maps were submitted for investigation of grades, street widths, and sidewalk widths by owners of the Subdivision of Hillside Manor, Lakeside #3, Lakeshore #1, and Thornton Terrace.

Investigation and surveys were made relative to grade conditions of Alpha Street between Rutland Avenue and Wilde Avenue, and of Filbert Street between Montgomery Street and Sansome Street.

Seven special grade maps involving special treatments were compiled and duly recorded.

Grades were changed on 49 blocks, a distance of four miles.

Sidewalk widths on 86 blocks were changed and established, a distance of nine miles.

Many W.P.A. projects for street widening were investigated and recommendations were made to widen the following:

Columbus Street - Montgomery Street to Bay Street
11th Street - Market Street to Division Street
Clayton Street - Waller Street to Frederick Street
Capp Street - 15th Street to 26th Street
Eureka Street - 17th Street to 23d Street
Polk Street - Turk Street to Post Street
Harriet Street - Howard to Folsom Street
Sherman Street - Folsom to Harrison Street
Post Street - Van Ness Avenue to Presidio

Also recommended were plans for walls, stairways, and roadway construction on Coso Street, Aztec Street, Stoneman Street and Bonview Street.

DIVISION OF SURVEYS

SURVEYS PERFORMED

For Public Contracts	26	
For Private Contracts	78	
For Municipal Departments	282	
Resurveys for Contracts	23	
Total for Public Improvements		410

LOT SURVEYS

For Private Owners	11	
For Municipal Departments	1	
		12
Total Lot Surveys		422

Surveys covered approximately 1585 blocks and crossing with a total of about 523,785 feet or 99.2 miles distributed a follows:

197,670 feet	of line and grade points for new street and sewer construction
47,290 feet	for W.P.A. surveys to set back curbs
17,740 feet	for street widening projects
26,120 feet	for block resurveys
90,945 feet	of monument lines
17,175 feet	for subsidence and earth slides
43,600 feet	for topographical surveys
10,585 feet	for Municipal Railway
9,630 feet	for Hassler Health Home
63,030 feet	for miscellaneous surveys listed below under their various titles

In addition, a total of 90.62 miles of precise levels wa run; 3,915 bench marks were checked or reestablished; 314 monu ments were either set, checked, referenced, or recapped; ther were 16 block resurveys which established block boundaries in ref erence to monument lines, and all improvements in these block were located.

W.P.A. SURVEYS COMPRISED THE FOLLOWING

11th Street, from Market Street to Division Street
Buena Vista Avenue, from Park Hill Avenue, Southerly
Capp Street, from 15th Street to 26th Street
Eureka Street, from 17th Street to 23d Street
Mission, Howard, Spear, and Steuart Streets, around new United States Post Office
Coso, Aztec, Stoneman, and Bonview Streets
Harriet Street, from Folsom Street to Brannan Street
Polk Street, from McAllister Street to Post Street
Post Street, from Taylor Street to Scott Street
8th Avenue, from Clement Street, southerly
King Street, from 2d to 3d Street
4th Street, from Market Street to Townsend Street
Oakdale Avenue, from Bayshore Blvd. to Selby Street
Visitacion Valley Sewer
Juniper Street, from Harrison Street to Bryant Street

STREET WIDENING PROJECTS

Post Street, from Montgomery Street to Taylor Street
3d Street, from Mariposa Street to Custer Avenue
Lombard Street, from Broderick St. to Steiner Street
19th Avenue, from Pacheco Street to Taraval Street
9th Street, from Market Street to Division Street

MUNICIPAL RAILWAY SURVEYS

Geary Street Railway, from Powell Street to Fillmore Street, and from Masonic Avenue to Jordan Avenue

MISCELLANEOUS SURVEYS

San Francisco Junior College
Bayshore Boulevard
El Camino Del Mar
Portola Drive service road, from Sydney Way to Waithman Way
Seal Rock Drive
Lake Merced Sewer
Alemany Boulevard Sewer
Clipper Street Extension
Pond Locations
Ocean Beach
Madera Street
Sea Cliff Pumping Plant
Testing High Pressure Mains
3d Street Bridge at Islais Creek
Delano Avenue, Ottawa Avenue, Nahua Avenue, Burlwood Drive, Los Palmos Drive, Melrose Avenue, Gaviota Way, Bella Vista Way, and El Sereno Court Street
Ocean View Terrace
Lakeside Subdivision #2
Hillside Manor

PRECISE LEVELS AND BENCH MARKS

District	Bench Marks	Distance - Miles
Richmond	83	1.32
Sunset	72	2.05
100 Vara	405	11.58
50 Vara	645	15.28
Mission	830	15.69
Western Addition	519	8.82
Potrero	230	7.38
Marina	436	9.27
Golden Gate Heights	310	7.60
Visitacion	81	2.93
Other Districts	304	8.70
Total Bench Marks Checked and Reestablished	3,915	Total Miles - 90.62

MAPS APPROVED AND FILED

Subdivision of Lakeside #2

Showing the opening of LaSalle St. from 3d to Mendell St.

Showing widening of Anza St. from Masonic Ave. to 518.75 Wly

Resubdivision of Assessor's Block 3588, Linda Street from 19th Street North

Showing the opening of Seal Rock Drive from 45th Avenue to E Camino Del Mar and Alta Mar Way from Seal Rock Drive to Pt Lobos Avenue

Ocean View Terrace

Resubdivision Lots 7, 8, 9, Block 30, West End Map #1

Showing the opening of Linda Street from 18th Street to a point 260 feet southerly

Showing the widening of Ledyard Street from Silver Avenue to 612 feet Southeasterly

Fernando Nelson's Subdivision of Silver Terrace

Showing the realignment of Grand View Avenue between Market Street and 23d Street

Geneva Heights Addition

Hillside Manor

Showing the widening of Silver Avenue from Thomas Avenue to Quesada Avenue, also the extension of Silver Avenue from Quesada Avenue to Palou Avenue

FEES RECEIVED FOR SURVEYS

1939	
July	$ -
August	90.30
September	236.32
October	2,226.65
November	337.00
December	137.50
1940	
January	1,316.17
February	511.14
March	85.50
April	1,217.10
May	-
June	1,267.27
Total - - -	$7,424.95

OFFICE WORK

In connection with and in addition to the foregoing, the office work included the following:

Data for the use of the surveyors in the field are computed and compiled in the office for each survey. From field surveys, monument lines are adjusted and monument maps drawn. Maps are drawn of street widenings, openings, closings, extensions, etc., which are filed in the office of the City and County Recorder. All recorded maps showing changes are furnished the Assessor's office for assessment purposes.

The 1" = 100' scale maps of the City and County, made up of 354 sheets, are kept up to date, showing all official data on street name changes, on street openings and closings, extensions, widenings, and all property acquired or sold by the City and County of San Francisco.

All appeals from the decision of the City Planning Commission in the matter of zone changes presented to the Board of Supervisors are checked to determine the total area of property represented by the signers of such appeals.

All actions to quiet title, referred to the City Attorney, are checked to determine whether any City and County property is involved in such actions.

Other office work consists of computing, writing, and checking all property descriptions for the Real Estate Department; investigating and checking maps of proposed real estate subdivisions, and also checking street descriptions for dedication purposes; answering petitions; making estimates; and furnishing information to the various municipal departments and to private engineers and surveyors, in addition to answering inquiries made by the public to the office of the Division of Surveys.

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Contract Amount	Expended to 6/30/40	Fund
			Date	%			
			BOULEVARDS, PAVING, GRADING, ETC.				
Army Street between Bryant to Harrison Streets - Lighting	R. Flatland	4/12/39	7/20/39	100	$ 3,540.00	$ 3,540.00	County Road
Athens Street between Excelsior Avenue & Avalon Street	Eaton and Smith	9/14/38	7/17/39	100	10,634.33	*1,204.34	Public Assessment & County Road
Brunswick St. between Allison & Guttenberg Streets	Eaton and Smith	1/3/40			(10,233.90)		Public Assessment & County Road
Brussels St. between Mansell & Ordway Street Grading	Eaton and Smith	9/20/39	5/4/40	100	513.15	*171.05	Public Assessment & County Road
Congdon Street between Trumbull Street & Alemany Blvd.	Eaton and Smith	6/2/39	12/5/39	100	4,081.35	*2,142.72	Public Assessment & County Road
Edward Street between Arguello Blvd. and Westerly one-half of Willard St. between Turk and Edward Streets	Eaton and Smith	12/20/39			(4,415.80)		Public Assessment & County Road
El Camino Del Mar - 27th Ave. & Lake St.	Eaton and Smith	2/7/40	3/13/40	100	4,225.80	4,225.80	Spec.Gas Tax Street Improvement

CURRENT CONTRACT DATA 1939-1940

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	%	Contract Amount	Expended to 6/30/40	Fund
			BOULEVARDS, PAVING, GRADING, ETC.		(Continued)		
42nd Avenue between Kirkham & Lawton Streets Improvement	Chas. L. Harney	1/3/40	4/26/40	100	$ 8,953.96	$ *2,735.71	Public Assessment & County Road
Gates Street between Powhattan Avenue & Bernal Heights Blvd.	Eaton and Smith	9/27/39			(6,201.70)		Public Assessment & County Road
19th Ave. Extension between Sloat Blvd. & Junipero Serra Blvd. - Second Contract	The Fay Improvement Company	8/11/39	11/17/39	100	29,463.99	29,463.99	1927 Boulevard Bonds
19th Avenue from Lawton to Pacheco Streets	Chas. L. Harney	11/3/39	4/22/40	100	85,721.80	85,721.80	County Road State Highway Trust
19th Avenue between Pacheco Street & Taraval Street	The Fay Improvement Company	10/6/39	4/24/40	100	106,389.30	106,389.30	County Road State Highway Trust
Ninth Street between Market Street & Division Street	Chas. L. Harney	6/19/40			(70,717.50)		Spec.Gas Tax Street Improvement
Ocean Avenue between Alemany Blvd. & San Jose Avenue - Street	Eaton and Smith	2/28/40	5/24/40	100	8,693.04	8,693.04	Spec.Gas Tax Street Improvement

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Contract Amount	Expended to 6/30/40	Fund
BOULEVARDS, PAVING, GRADING, ETC. (Continued)							
Portola Drive Widening - Sydney Way to Waithman Way	Chas. L. Harney	4/3/40		21	$(13,161.00)	$ 2,708.10	Spec.Gas Tax Street Improvement
Post Street - Market to Taylor Sts. - Reconstruction	Chas. L. Harney	3/29/40	6/5/40	100	37,910.33	37,910.33	Spec.Gas Tax Street Improvement
Sequoia Way (westerly half) between Omar Way and Bella Vista Way	Eaton and Smith	5/17/40			(2,735.50)		County Road
Sloat Blvd.-North Side - Westerly from 19th Ave. Curb and Sidewalk	Love and Haun	7/14/39	8/23/39	100	1,231.66	1,231.66	County Road
34th Ave. & 35th Ave. - Moraga to Noriega Sts. and Moraga St. between 34th Ave. to 35th Ave.	Chas. L. Harney	6/19/39	8/30/39	100	7,268.94	*1,200.00	Public Assessment County Road
36th Ave. - West side Quintara to Santiago - 37th Ave.-East Side Rivera & Santiago & between Ulloa & Vicente Sidewalks	DeLuca & Son, Inc.	3/1/40	5/3/40	100	1,725.12	1,725.12	1927 Boulevard Bonds

CURRENT CONTRACT DATA 1939-1940

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Contract Amount	Expended to 6/30/40	Fund
		BOULEVARDS, PAVING, GRADING, ETC.			(Continued)		
East half 37th Avenue between Lawton & Moraga Streets	Eaton and Smith (Assignee of E.J. Treacy)	4/10/40			$ (3,940.00)		County Road
38th Avenue (Easterly one-half between Lawton & Moraga Sts.)	Chas. L. Harney	9/1/39	12/4/39	100	3,469.49	$ *230.62	Public Assessment & County Road
			SEWERS				
Alemany Blvd. Sec. A - Mission Street to Crescent Avenue	W. J. Tobin	9/29/39	2/14/40	100	20,765.23	20,765.23	1927 Boulevard Bonds
Bay Shore Blvd. Sec. A - between Waterloo Street & Helena Street	M. J. Lynch	3/15/40	6/14/40	100	22,611.80	22,611.80	1927 Boulevard Bonds
Cayuga Avenue between Greece Street and Seneca Ave. - Sewer Replacement	Chas. L. Harney	8/25/39	9/29/39	100	1,115.10	1,115.10	General
Graystone Terrace - Iron Alley westerly, and Iron Alley, Graystone Terrace	The Fay Improvement Company	9/27/39	11/16/39	100	1,254.96	*349.40	Public Assessment & General

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Contract Amount	Expended to 6/30/40	Fund
			Date	%			
			SEWERS (Continued)				
Hassler Health Home - Main Sanitary Sewer	John Pestana	2/21/40	6/21/40	100	$ 37,592.38	$ 37,592.38	Hospital Bonds 1938 P.W.A.
Hassler Health Home - Sewage Treatment Plant	Albert E. Mangs & Associates	2/13/40		67	(32,946.00)	22,110.00	Hospital Bonds 1938 P.W.A.
Ingleside Sewer between Junipero Serra Blvd. & 19th Avenue Replacement	Eaton and Smith	11/22/39	3/29/40	100	11,650.15	11,650.15	General
Lake Merced Sewer Trestle - Replacement	Martinelli Construction Co.	4/19/40	7/31/40	45	(9,659.00)	3,870.00	General
Richmond-Sunset Sewage Treatment Plant - Auxiliary Equipment for Sand Pump	E. J. Treacy	10/6/39	11/17/39	100	1,445.00	1,445.00	General
Richmond-Sunset Sewage Treatment Plant - Boundary Fence	E. J. Treacy	10/6/39	11/24/39	100	2,273.00	2,273.00	General
Richmond-Sunset Sewage Treatment Plant - Installation of Miscellaneous Pipe	Anderson & Rowe	6/23/39	8/22/39	100	1,602.00	1,602.00	General
Sea Cliff Sewage Pumping Station #2	C.C.W. & H.H. Haun	5/3/40			(56,692.00)		General

CURRENT CONTRACT DATA 1939-1940

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Contract Amount	Expended to 6/30/40	Fund
			BRIDGES				
4th Street Bridge over Channel St. Waterway - Repairs	M.B.McGowan, Inc.	6/30/39	12/4/39	100	$ 17,847.75	$ 17,847.75	Spec.Gas Tax Street Improvement
Sixth St. Bridge over Channel St. Waterway - Repairs to Fender	Healy-Tibbits Construction Co.	4/26/40	6/28/40	100	5,476.72	5,476.72	Spec.Gas Tax Street Improvement
Third St. Bridge over Channel St. Waterway - Cleaning and Painting	R.P.Paoli & Co.	10/18/39	12/4/39	100	1,790.00	1,790.00	Spec.Gas Tax Street Improvement
Third St. Bridge over Islais Creek Channel - Repairs	Healy-Tibbits Construction Co.	7/26/39	11/24/39	100	5,748.15	5,748.15	Spec.Gas Tax Street Improvement

Contract amounts in ( ) are based on estimated quantities.

INFORMAL CONTRACTS

Description	Type of Work	Amount	Fund
Bayshore Boulevard at County Line	Safety Island	$587.00	1927 Boulevard Bonds
El Camino Del Mar East of 32d Avenue	Widen Roadway, etc.	532.50	Special Gas Street Improvement
Evans Avenue at Selby Street	Alteration to auxiliary Water Supply System	964.22	General
43d & 44th Avenue between Taraval & Ulloa Streets	Removal of sand	583.00	County Road
Intersections of Otsego Avenue with Oneida Ave. & Seneca Avenue	Repave	648.00	General
Laguna Honda Blvd. at Clarendon Avenue	Storm Drain Repairs	485.00	County Road
Mariposa Street between Carolina & Arkansas Sts.	Sidewalk	698.00	County Road
O'Shaughnessy Boulevard	Services of Geologist	600.00	Special Gas Street Improvement
O'Shaughnessy Boulevard at Encline Court	Test pits	345.91	Special Gas Street Improvement
Richmond-Sunset Sewage Treatment Plant	Pole Raiser and Potheads	115.00	General
Richmond-Sunset Sewage Treatment Plant	Repair lining of ferric chloride storage tank	60.00	General
Sea Cliff Pumping Station #2	Test borings	110.18	General
States Street between Castro & Levant Sts.	Removal of slide	478.00	County Road
36th Avenue Westerly side between Ulloa & Vicente Streets	Sidewalk	403.00	County Road
39th Avenue between Ulloa and Vicente Sts.	Sand Removal	400.00	County Road
Vicente Storm Water Outfall	Repairs	894.00	General

DIVISION OF DESIGN

This division investigates and prepares reports on all proposed major projects, including preliminary designs and estimates of cost. When a decision has been reached to proceed with a project, for which money is available, this division prepares all plans and specifications for construction contracts.

Studies and investigations on some projects continue over several years, because the necessary funds for construction are not available, or because other projects of greater importance take precedence.

The work done by this division is divided into two groups. One group includes those projects which were completed. The other group includes projects on which work was done but completion of which will be deferred until a later date. It will be noted that the report of this division refers to investigations, studies, plans and specifications only, and not to construction.

During the year this division completed investigations, plans and specifications for projects totaling an estimated cost of $649,348. The total estimated cost of projects on which work was done, but not completed, was $5,617,814.

DIVISION OF DESIGN

(These items refer to plans and specifications and not to actual construction)

	APPROXIMATE COST	
Major Divisions	Plans and Specifications Complete	Plans and Specifications Under Way
Boulevards (1927 Bonds)	$ 32,000	$ 20,000
Bridges - Second one-quarter cent gasoline tax		
Estimates, Investigations and Reports		
Joint Highways		
Map		
Miscellaneous Plans (County Roads)		186,780
Sewers, Extensions & Pumping Stations		
One-quarter cent Gasoline Tax - State Highways	492,668	271,000
One-quarter cent Gasoline Tax - Major Streets	29,531	5,095,300
Special Improvements (County Roads)		13,700
Tax Rate Plans	91,115	30,049
Traffic Engineering Section	4,034	985
	$649,348	5,617,814

DIVISION OF DESIGN

These items refer to plans and specifications and not t actual construction.

BOULEVARDS, STREETS AND HIGHWAYS	Contract Plans Complete	Contract Plans Under Way	Lands (Estimated
Alemany Boulevard - Sec. "A" Bayshore Blvd. - Mission St.			
Bayshore Boulevard - Sec. "A" Cortland Ave. to Silver Ave.			
Bayshore Boulevard - Sec. "A" Potrero Ave. - Cortland Ave.			
19th Avenue Extension	$ 32,000		
Bernal Avenue Slope Repair		$ 20,000	
STATE HIGHWAYS (One-Quarter Cent Gasoline Tax)			
Lombard St. Widening		271,000	$925,000
19th Avenue - Lincoln Way to Sloat Boulevard	489,000		816,000
Traffic Striping, Route #56	547		
" " " 2	1,297		
" " " 55	126		
" " " 68	1,433		
Minor Improvements " 2	191		
" " 68	74		
MAJOR STREETS (One-Quarter Cent Gasoline Tax)			
Army Street Widening		117,000	270,00
Clipper Street Extension		103,500	20,00
El Camino Del Mar - 31st and 32d Avenues	665		70
Market Street-Portola Drive	21,000	1,250,000	
Market & Clayton-Safety Zone		1,800	
Santa Rosa Avenue - Grade Separation		43,000	
6th St. - Brannan to 3d Street		1,232,000	33,00
3d Street Widening		1,316,000	268,00
13th St. - Mission to Bryant		203,000	134,80
4th Street Bridge		19,000	
Islais Creek Bridge		810,000	
6th Street Bridge	5,500		
3d Street Bridge	2,000		
Traffic Striping	366		

EWERS, RICHMOND-SUNSET SEWAGE REATMENT PLANT, AND SEWAGE PUMPING STATIONS	Contract Complete	Plans Under Way	Lands (Estimated)
xtension and Reconstruction of Main Sewers:			
Vicente Sewer	$ 950		
Lake Merced Trestle	10,045		
Ingleside Sewer	13,685		
Cayuga Avenue Sewer	1,615		
eacliff Pumping Station	58,000		
ichmond Plant - Fencing	2,480		
ichmond Plant - Rails	2,700		
ichmond Plant - Sand Pump	1,640		
ewage Pumping Stations (Existing)			
ewage Pumping Stations (Alterations)		$ 1,649	
akdale Avenue Sewer - WPA		4,200	
akdale Avenue Sewer - Piling		5,700	
isitacion Valley Sewer Extension		18,500	

STIMATES, INVESTIGATIONS, AND REPORTS	Status
ohn Swett School Gymnasium	
and Investigation - Richmond Sunset Sewage Treatment Plant	
igh Pressure Pipe Profile - Survey over Sewers	
eacon and Flasher - Columbus and Broadway	
ighting - Blue Print Room	
len Park School	
'Shaughnessy Boulevard - Encline Court Slide	
oso and Aztec Streets	
ighway Manual and Standards	Under Way
ewer Manual and Standards	Under Way

SPECIAL IMPROVEMENTS County Roads	Contract Plans Complete	Contract Plans Under Way	Lands (Estimated)
Parker Avenue Slide		$169,000	
Laidley Street Slide		480	
Joost Avenue Slide		3,600	
Engineering Studies for which no Special Appropriations had been made:		13,700	

Alemany Boulevard Section "A" - Retaining Wall
Alemany Sewer - Section "G" - Pile Comparison
Alpha Street - Tioga - Tucker Avenue
Aquatic Park - Tentative Plan
Army Street Wall and Railing, south of Evans Avenue
Army Street Wall and Walk at Marin Street
Aztec Street - Retaining Wall and Steps
Bernal Avenue - Report on Slides
Budget 1940-1941 - Estimates
Brussels Street Slide - Investigation
Calhoun and Union Streets - Walls and Wire Fence
Corbett Avenue & Clayton Avenue - Investigation - Sidewalk
Correct Maps
Coso, Aztec and Stoneman Streets
18th Avenue near Presidio Wall
Encline Court - Possible Slide - Investigation
Ensign Fountain - Removal Cost
Francisco Street at Larkin Street - Pavement, etc.
Great Highway Guard Rail
Himmelman Place - Storm Damage
Kirkwood and Mendell Streets - Slide
Laguna Honda Boulevard - Extension Retaining Wall
Laidley Street - Slide - Investigation
Liberty St., Noe St., and Rayburn St. - Plans for Wall & Rails
Lobos Creek Bridge - El Camino Del Mar - Fill and Culvert
Lombard Street - Retaining Wall
Macondray Street - 1060 Green Street - Slide
Market Street and Grand View Avenue - Raised Pavement
Market Street, Romain Street, Glendale Street - Drains
Market Street Railway Tracks - Paving
Miguel Street at Beacon Street - Retaining Wall
North Point Sewer - Design - Manhole
Olympic Club - Slide - at Skyline Boulevard
O'Shaughnessy Boulevard and Encline Court - Grading
O'Shaughnessy Boulevard and Glen Park - Wall
O'Shaughnessy Boulevard and Slide - Grading, plans & Specifications
O'Shaughnessy Boulevard - Drains and Pavement
Proposed Disposal of City Property
Revamp Project Statements
San Bruno Avenue - Leland and Visitacion Avenue
Santiago Street and 14th Avenue - Westerly Estimate Quantities
Seventeenth Street and Bryant Street - Report on Borings
Silver Avenue - Retaining Wall - Investigate Damage
Sixteenth Avenue at Presidio Wall - Reconstruction
Spur Track at Newhall Street and Donner Avenue - Load on Sewer

PECIAL IMPROVEMENTS
County Roads (Continued)

ngineering Studies for which no Special Appropriations had been made - continued:

- Standards - Design of Sewers
- Stanley Drive at Charles Street - Pedestrian Path
- Street Closings
- Surface Drainage Standards
- Trumbull Street and Congdon Street - Grade and Wall
- Twin Peaks - Leveling Point
- Twenty-sixth Street - Closing - Area Involved
- Union Street and Montgomery Street - Design Stairs
- Union Square Garage - Pedestrian Subway
- Webster Street Extension - Duboce Avenue to Market Street

STIMATES, INVESTIGATIONS, AND REPORTS

	Status
oint Highway No. 10	
Junipero Serra Boulevard Extension Sec. #2 - Cypress Lawn to Sneath Road	Under construction by W.P.A.
Junipero Serra Boulevard Extension Sec. #3 - Sneath Road to Burlingame	Under Way

APPING

nderground Structures	Under Way

Report of the

Bureau of Engineering

1940-1941

Department of Public Works

City and County of
San Francisco

JOHN J. CASEY
City Engineer

ANNUAL REPORT

OF THE

BUREAU *of* ENGINEERING

OF THE

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF
SAN FRANCISCO

FISCAL YEAR ENDED JUNE 30, 1941

ANGELO J. ROSSI	*Mayor*
THOMAS A. BROOKS	*Chief Administrative Officer*
A. D. WILDER	*Director of Public Works*

JOHN J. CASEY
City Engineer

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

September 30, 1941

SS ALL COMMUNICATIONS TO THE
CITY ENGINEER

IN YOUR REPLY, REFER TO FILE:

Mr. A. D. Wilder, Director
Department of Public Works
City and County of
San Francisco

Dear Sir:

Herewith I transmit the Annual Report of the Bureau of Engineering for the fiscal year ended June 30, 1941.

The Seacliff Sewage Pumping Station No. 2 was completed in March, 1941, and is now in operation. This station was built to remove the sewage pollution from Baker's Beach by pumping the sanitary flow from the Seacliff district to the Richmond sewer tunnel.

Ninth Street, between Market and Division Streets, and also Post Street, between Taylor Street and Van Ness Avenue, were improved by the widening and reconstruction of the roadways. Moneys for this work were derived from the special gasoline tax street improvement fund.

A contract was awarded for the repair of pavements on State Highway Routes Nos. 2, 55, 56, and 68.

Construction work is in progress on a section of Ocean Shore Highway, including bridges at Pescadero Creek and on San Gregorio Creek.

A complete summary of operation and maintenance of the Richmond-Sunset Sewage Treatment Plant is included in this report.

Six sewer projects were completed during the year, including construction of a new timber trestle supporting a 24-in. cast iron sewer.

Yours respectfully,

John J. Casey
John J. Casey
City Engineer

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Ninth Street, looking north from Folsom Street
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ORGANIZATION AND PERSONNEL

John J. Casey	City Engineer
C. E. Healy	Assistant City Engineer
S. P. Duckel Surveys, Street and Sewer Design and Construction, Street Assessments, Permits and Complaints	Engineer of Street Improvement Investigations
W. H. Ohmen Special City Projects, Boulevards, Sewers, Sewage Disposal, Bridges, Tunnels, Auxiliary Water Supply System, etc.	Chief Civil Engineering Designer
H. J. Stahle*	Chief Surveyor
C. H. Stern	Chief Surveyor
C. M. Taylor Supervising Construction (Major Projects)	Chief Civil Engineering Inspector
F. O. Shutts Supervising Construction (Minor Projects)	Chief Civil Engineering Inspector
L. Glick Contract Estimates and Payments, Personnel and Office Administration Records	Office Engineer
G. W. Purser	Traffic Engineer
B. Benas Richmond-Sunset Sewage Treatment Plant	Superintendent

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*Retired February 4, 1941

BOULEVARDS, STREETS, AND HIGHWAYS

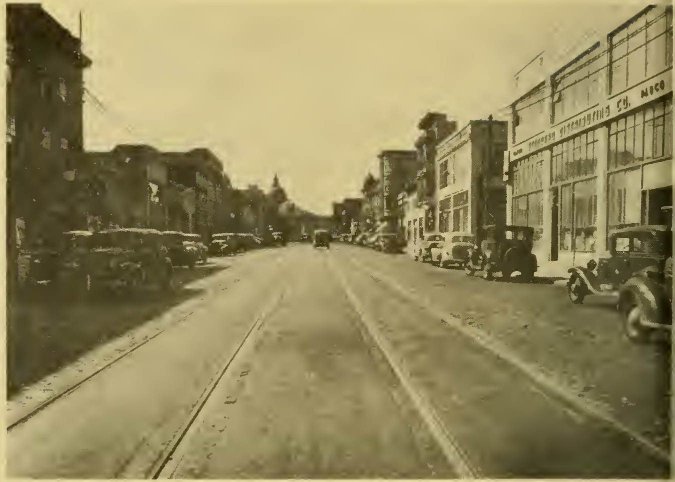
BOULEVARD CONSTRUCTION OUT OF BOND ISSUES

Bayshore Boulevard

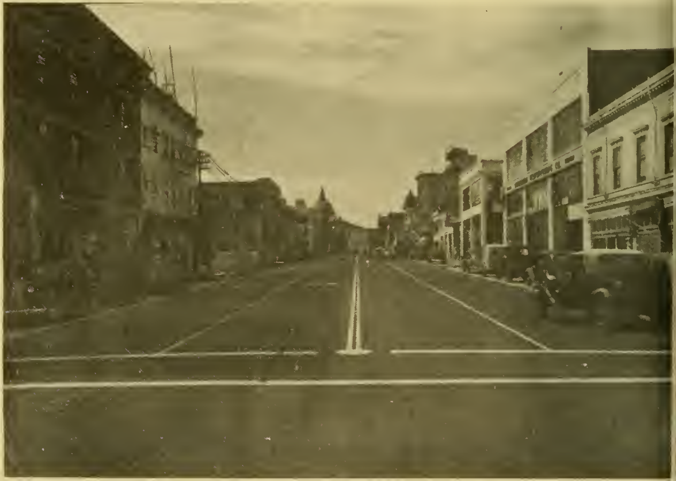
From Waterloo Street to Islais Creek Channel. This section of the roadway has not reached final settlement; therefore, a new temporary pavement of 6-in. water-bound macadam base and a 4-in. asphaltic concrete pavement was built replacing the old pavement. Also redwood and concrete curbs, asphalt-on-macadam sidewalk, catchbasins, storm water inlets, and culverts were constructed. The electrical work included the installation of a traffic control system, conduits and the moving of light standards. The work was done at a cost of $19,702.

Bernal Avenue

Between Taylor Street and Fairmount Street. Slope repair work is now under way, consisting of the construction of timber baffles with metal anchors, installing metal drains, restoring and planting side slopes and berms, and doing other incidental work. Contract cost was $13,600.



NINTH STREET
Looking North from Folsom Street
Before Reconstruction



NINTH STREET
Looking North from Folsom Street
After Reconstruction

MAJOR STREET RECONSTRUCTION OUT OF SPECIAL GASOLINE TAX STREET IMPROVEMENT FUND*

Ninth Street

Between Market Street and Division Street. This street was improved by the widening and reconstruction of the roadway which included the removal of the Market Street Railway Company's rails and ties between Brannan Street and Market Street. The existing pavement in the track area was removed and replaced by a new asphaltic concrete pavement. Between Market Street and Mission Street the wearing surface was removed and replaced. Between Mission Street and Division Street basalt blocks were removed and replaced with a 6-in. concrete base and 2-in. asphaltic concrete pavement; a concrete parking lane 7 feet wide was constructed adjoining the new curb line. Existing stone curb was redressed and reset, in addition to the construction of new armored concrete curbing. Catchbasins were removed and reconstructed. Low pressure and high pressure fire hydrants, traffic signals, and lighting standards were removed to a new location. Contract cost was $78,732.

Polk Street

Between McAllister and Turk Streets. The widening and reconstruction included the reduction of sidewalk widths to 10 feet, the construction of concrete parking lanes 6 feet wide, re-setting stone curbs, and catchbasins, re-locating street signs, traffic signals, removing and replacing asphaltic wearing surface. Contract cost was $5,180

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*Second One-Quarter Cent Gasoline Tax

Post Street

Between Taylor Street and Van Ness Avenue. The Roadway was widened and reconstructed; the sidewalk widths were reduced to 10 feet; 6-ft. concrete parking lanes were constructed adjoining the new curb line Between Taylor Street and Leavenworth Street car tracks were taken up; the existing pavement of the entire roadway was removed; and a new pavement, consisting of 6 inches of concrete and 2 inches of asphaltic concrete wearing surface was constructed. Between Leavenworth Street and Van Ness Avenue the wearing surface and pavement were replaced where necessary. Stone curbs were redressed and re-set, catchbasins, low pressure hydrants, traffic signs, and electroliers were moved to new locations. Contract cost was $39,362.

POST STREET
West of Taylor Street
During Construction

BOULEVARDS BY JOINT HIGHWAY DISTRICTS

District #9
Ocean Shore
Boulevard

Construction work on the section of Ocean Shore Highway from two miles south of Tunitas to Lake Lucerne including the bridges at Pescadero Creek and San Gregorio Creek, a distance of 8.8 miles which was started February 21, 1940, is progressing satisfactorily; and the State forces expect to have it finished by September 1940. This section of the highway will be shortened a distance of 3.4 miles by the new alignment. The Campbell Construction Company of Sacramento was awarded the bridge contracts, their bid being $82,964.

A grading and paving contract for the Rockaway Beach-Edgemar section was awarded to A. Teichert, bid $76,023, and work was started November 15, 1940.

The Granite Construction Company of Watsonville was awarded a grading and paving contract for a section from Davenport to 1.5 miles south. Work was started November 15, 1940 and completed June 25, 1941, and cost $75,000.

A grading and paving contract was let to N.M.Ball Sons of Berkeley, bid $9,510, for a 0.4 mile section at Montara Creek. Fred Fredenburg of South San Francisco was awarded the $2,927 contract to construct an arch culvert at this location. Work was started May 28, 1941.

District #10
Junipero Serra
Boulevard
Extension

W.P.A. forces working on the section of Junipero Serra Boulevard from Cypress Lawn to Sneath Lane, 2.9 miles, completed the roadway excavation and drainage structures in July 1940. Construction of the roadway pavement was then started and in November 1940 this work was stopped on account of winter rains.

MISCELLANEOUS STREET CONSTRUCTION

IMPROVED UNDER PUBLIC CONTRACT BY ASSESSMENT DISTRICT

Hahn Street From Visitacion Avenue to south of Sunnyvale Avenue. Improvements included the construction o pavement, concrete curbs and sidewalks, stree lighting system, and sewers. The work was done by public assessment at a cost of $24,481 of which the city contributed $6,595.

Silver Avenue Between Thomas Avenue and Quesada Avenue. This avenue was improved by the construction of asphaltic concrete pavement, concrete curb and sidewalks and sewers. The work done was by public assessment and cos $17,465 of which the city contributed $13,575.

Thirty-eighth Avenue Between Taraval Street and Ulloa Street. The improvement included grading to the official grade asphaltic concrete pavement, sewers, and necessary manholes. This work was done by public contract at a cos of $13,301 of which the city contributed $3,861.

Golden Gate Heights Work done on Golden Gate Heights included the construction of asphaltic macadam pavement, consisting of 6-in. water-bound macadam base and a 2-in asphaltic wearing surface, concrete curbing, sewers, catchbasins and manholes. The streets improved under this contract were Lomita Avenue between Lawton Street and Sixteenth Avenue; Lurline Street between Kirkham Street and Funston Avenue; Norieg Street between Eleventh Avenue and Funston Avenue, and betwee Fifteenth Avenue and Sixteenth Avenue. Work was done under public assessment at a cost of $18,734 of which the city contributed $9,703.

IMPROVED UNDER PRIVATE CONTRACT

Many subdivisions were further developed during the year. Work was done on: Potrero Housing, El Sereno Court, Park Manor, Hillside Manor, Lakeside Subdivision No. 3, and Lakeshore Park Subdivision No. 2.

Other private contracts were:

Bella Vista Way - Gaviota Way to Sequoia Way
Cayuga Avenue - Foote Avenue to Modoc Avenue
Connecticut Street - 26th Street to Army Street
Clement Street - 38th Avenue, 125 feet westerly
Castro Street, westerly side, opposite Hill Street
Detroit Street - Stillings Avenue to Melrose Avenue
Eighteenth Avenue (westerly half) - from 300 feet south of Vicente Street to 610 feet south of Vicente Street.
46th Avenue - Ulloa Street to Vicente Street
47th Avenue - Lawton Street to Moraga Street
45th Avenue - Quintara Street to Rivera Street
14th Avenue - Lake Street to 285 feet northerly
First Street - Harrison Street to 265 feet southeasterly
43d Avenue - Rivera Street to Santiago Street
44th Avenue - Quintara Street to Rivera Street
40th Avenue - Ulloa Street to Vicente Street
Justin Drive - Alemany Boulevard to Genebern Way
Lyon Street (easterly half) - Jefferson Street to Marina Boulevard
Lawton Street - 46th Avenue to 47th Avenue
Ledyard Street - Silver Avenue to 508 feet southerly
Ledyard Street - Mercury St. to 200 feet northerly
Mt. Vernon Avenue - Delano Avenue to San Jose Avenue
Modoc Avenue - Cayuga Avenue to 175 feet northwesterly
Moraga Street - 38th Avenue to 39th Avenue
Marin Street - Evans Avenue to 175 feet easterly
Moraga Street - 41st Avenue to 42d Avenue
Moscow Street - Excelsior Avenue to Brazil Avenue
Melrose Avenue - Detroit Street to Teresita Boulevard
Nevada Street - Ogden Avenue to Tompkins Avenue
Ortega Street - 31st Avenue to 36th Avenue
Ortega Street - 30th Avenue to 31st Avenue
Princeton Street - Silver Avenue to Sweeny Street
Peninsula Avenue - 224 feet northerly from Blanken Avenue to northerly termination
Pacheco Street - 22d Avenue to 23d Avenue
Quintara Street - 29th Avenue to 30th Avenue
Quintara Street - 44th Avenue to 45th Avenue
Quintara Street - 10th Avenue to easterly terminal
Rivera Street - 34th Avenue to 35th Avenue
Sloat Boulevard - 36th Avenue to 128½ feet easterly
Sweeny Street - Princeton Street to University Street
Stillings Street - Teresita Boulevard to Detroit Street
Sydney Way - Fowler Avenue to Portola Drive
22d Avenue - Ortega Street to Pacheco Street
35th Avenue - Noriega Street to Ortega Street

23d Avenue - Ortega Street to Pacheco Street
37th Avenue - Lawton Street to Moraga Street
30th Avenue - Pacheco Street to Quintara Street
34th Avenue - Noriega Street to Ortega Street
23d Avenue - Pacheco Street to Quintara Street
32d Avenue - Noriega Street to Ortega Street
33d Avenue - Noriega Street to Ortega Street
38th Avenue - Moraga Street to Noriega Street
36th Avenue - Ortega Crossing
39th Avenue - Moraga Street to Noriega Street
Yorba Street - 36th Avenue, 155 feet easterly

AUXILIARY WATER SUPPLY SYSTEM

No extensions were made to the system during the fiscal year. Plans and specifications were prepared for alterations to the existing installations, made necessary by the proposed improvements of streets and boulevards.

The principal changes made in the high pressure system were in connection with the widening of Army Street and the first section of Third Street.

Plans and specifications were also prepared for the installation of a 75,000 gallon reinforced concrete fire cistern to be located in the vicinity of the California Palace of Legion of Honor.

Corrections were made to records and maps of the system, and information as to the size and locations of the various units was furnished to public utilities companies.

SEWERS

BOND SEWER CONSTRUCTION

Hassler Health Home

The sewage treatment plant has been completed on land owned by the City and County of San Francisco, situated in San Mateo County about two miles west of Redwood City. The work included grading of the site, the construction of an Imhoff tank and building, chlorine and sludge pump house, sewage lift station, sludge drying beds, mechanical and electrical work and equipment, drains, sewers, and pavements. Contract cost was $32,946. This project was paid for out of Hospital Bonds of 1938.

Alemany Boulevard

Between Crescent Avenue and Bayshore Boulevard. The work consisted of the construction of 12-in., 15-in., and 21-in. vitrified clay pipe sewers encased in concrete and supported on untreated timber piles, together with side sewers, manholes, and appurtenances. Contract cost was $37,658.

CURRENT CONSTRUCTION

Lake Merced

A new timber trestle about 430 feet long has been completed to replace an existing structure which was in dangerous condition. This trestle supports a 24-in. castiron sewer. Contract cost was $9,689.

Oakdale Avenue

Between Patterson and Barneveld Avenue. The work done included furnishing, handling, driving, and cutting off timber piles as part of the work necessary for the replacement of the existing sewer. The sewer was built by forces of the W.P.A. Contract cost for pile work was $6,303.

TRAFFIC

The Traffic Engineering Section acts in an advisory capacity to the Police Commission in matters pertaining to traffic. Under the City Charter, the Commission has the power to regulate traffic, including the location and use of traffic control devices. This Section supervises traffic striping, the installation and maintenance of signs of all types, and makes plans, reports and recommendations on traffic control systems.

Two reports were made for proposed flexible progressive traffic signal systems on two state highways within the city: One for Bayshore Boulevard and Potrero Avenue from the southerly county line to Tenth and Division Streets; the other was for Nineteenth Avenue through Golden Gate Park to Fulton Street, thence along Park-Presidio Boulevard to Lake Street to connect with the recently completed State Highway from Lake Street to the Golden Gate Bridge. This connection serves the Golden Gate Bridge traffic and also the Marina district.

Plans and specifications were prepared for the construction of traffic islands, center islands, and the installation of a traffic control system, safety lighting, signs, and beacons on Nineteenth Avenue and Park-Presidio Boulevard, State Highway Route #56. As part of this project, a contract was awarded for the purchase of the signals and concrete standards at a cost of $24,100.

Plans and specifications were prepared for the routing of vehicular traffic during street construction with adequate directional and warning signs for the following projects:

State Highway Route #68, Bayshore Boulevard, from Waterloo Street, to Islais Creek Channel - repaving
State Highway Route #2, Lombard Street, from Van Ness Avenue to Broderick Street - widening
Third Street, from Mariposa Street to 23d St. - widening
Third Street, from 23d Street to Custer Ave. - widening

El Camino del Mar in Lincoln Park - repairs and paving
Market Street from Eagle Street to Short Street -
  traffic islands and paving
Great Highway near Taraval Street - steel bulkhead
Army Street, from South Van Ness Avenue to Bartlett
  Street - widening

Traffic counts were made at 45 intersections and preliminary plans and estimates prepared for channelization at 36 of these locations.

At the Off Ramp of the Bay Bridge, Fifth Street and Harrison Street, an additional signal was installed and the signals put on three-phase operation, giving a separate phase to each movement of traffic. At the south end of the Third Street and Channel Bridge, a traffic island was removed and the signal relocated.

The regular maintenance program of traffic striping and pedestrian lane markings was continued; 230 miles of lane stripes and crosswalks at 796 intersections were painted, using 6,300 gallons of white traffic lacquer; total cost including labor and material was $36,000. Twenty-seven intersections were investigated and conditions improved by pavement markings. The street sign program included the installation of 168 new street signs, 314 signs repaired, and 400 painted, at a total cost of $7,500.

"Stop" signs, 15 of the flasher electric type and 153 of standard reflector type were installed, mostly for replacement of obsolete and damaged signs.

A total of 207 warning, regulatory and guide signs of plain and reflector type and 1,040 parking restriction signs were installed where requested by the Police Department at a cost of $5,000.

SEACLIFF SEWAGE PUMPING STATION

Sewage pollution has been removed from Baker's Beach on the South Bay at the entrance to the famous Golden Gate by the construction of a new sewage pumping station. This Beach is one of San Francisco's popular recreational beaches and is well protected from heavy tidal action.

The Seacliff sanitary district comprises 93 acres with a population of 2500. Sewage from this section is pumped through a 1700-ft. force main into the Richmond sewer tunnel. This sewage, together with sewage from the adjacent Richmond district which formerly was discharged at Baker's Beach, is now treated and disinfected at the Richmond Sunset Sewage Treatment Plant which is situated in the southwest corner of Golden Gate Park.

The pumping station building is of reinforced concrete, and as plywood was used for the forms for the exterior surfaces, a smooth natural concrete finish was obtained. It is located at the rear of a lot half way up the cliff above Baker's Beach with sidewalk access from Seacliff Avenue near Twenty-sixth Avenue. The front of the lot is landscaped with ice plants of two varieties.

Entrance to the station is by a long concrete stairway with intermediate landings. At the bottom of the entrance stairway is a landing platform, permitting entrance to the sump room or to the control room.

Below the sump room floor is the sump into which the sewage enters after passing through a cage screen. This cage is lifted by an electric hoist from the sump to an elevation above the sump room floor level where screenings are removed to a shredder with the help of an apron and removing fork. The shredder returns the screenings to the sump below.

The sump room is provided with a service sink having hot and cold water and a hose for washing down the sump. Access to the sump is by means of a vertical safety-type ladder in a floor well, protected by a railing with a self-closing access gate. Adjacent to the ladder is a gauge for determining the level of sewage in the sump.

The sewage pump and the storm sewage pumping unit are controlled automatically by a float control switch, operated by a ceramic float in a cast iron tube. Sewage flow into the sump can be stopped by a manually operated gate valve with floor stand, while during heavy rains excess storm water overflows a weir to the beach below.

The control room, toilet room, and pump room below are entered by a door opening onto the exterior stair landing platform.

In the control room is located the main switchboard (of the dead front type) in which are mounted circuit breakers, metering instruments, control switches, motor starters, time switches, relays, and recorders for flow meter and pressure gauge.

A stairway leads to the pump room below in which are located two 4-in. horizontal type centrifugal sewage pumps, and two 5-in. pumps connected to form a series pumping unit. A separate water system consists of make-up tank, two turbine type centrifugal pumps, and pneumatic water tank which supplies sealing water to the stuffing box of each pump, to the flow meter, and to the shredder. Compressed air is supplied by a single stage compressor driven by a motor through a "V" belt.

Below a suspended ceiling, consisting of acousti-celotex concrete tile above the pumps, are mounted two I-Beams on which is installed a hand traveling crane of 1½-ton capacity. The walls of the control room and the pump room are finished with celotex building board insulation. These two rooms are heated by electric unit heaters so arranged as to draw in a small quantity o fresh air and then mix it with recirculated room air. The heaters are thermostatically controlled in each room.

A manually operated venti-louvre in the wall of the control room on the leeward side of the building allows a constan escape of air.

In the discharge header is located a short tube venturi meter for registering the rate and total quantity of sewag pumped. The differential in pressure is transmitted through piping and settling chambers to a transmitter which electricall transfers the rate to a recording instrument located on a pane of the switchboard.

Water-hammer pressure waves are dampened by a 48-in. dia eter, 8-ft. surge tank, given an initial charge of compress air. The discharge line from each pump is fitted with lev weighted check valves which close rapidly when the pump mot circuit is opened. The surge tank is connected to the end of th force main (pump header) in a vertical position without any obstructions. In operation, the air pressure in the surge tan forces a volume of sewage into the header when the pumping hea is removed, thereby dampening the water hammer waves, both abnormal and sub-normal. A diaphragm pressure box is connected t the pump header which is the lower end of the force main. Pressure is transmitted to a recording pressure gauge on the switchboard. This method of water-hammer control is very effective f sewage pumping force mains that have high total dynamic heads.

The sewage is lifted approximately 105 feet through a 1700-ft. force main to a manhole connecting with a 35-ft. vertica drop pipe which leads into the Richmond Sunset tunnel. This dro pipe acts as a siphon reducing the total dynamic pumping head thereby increasing the station pumping capacity.

The pumping equipment consists of two 4-in. centrifugal sewage pumps each with a discharge capacity of 800 G. P. M. against a total dynamic head of 105 feet, and two 5-in. centrifugal sewage pumps connected in series, discharging 1400 G. P. M. against a total dynamic head of 140 feet. The 4-in. pumps normally handle the sewage flow either single or in parallel.

UNDERGROUND SECTION

The Underground Section is part of the Division of Design. The principal duties of this section are to make detailed studies of all private and public utility occupancy in city streets. When preliminary plans of any construction work are completed, copies are sent to all utilities, including oil companies, requesting that they outline on these plans all surface, and subsurface structures and pipe lines, etc. that they may own and promptly return the plans to this office. When any contract has been awarded, all interested utilities are notified and their cooperation with the contractor is enlisted.

During the year, the following plans were prepared from information received from the utilities and oil companies:

Post and Market Streets, to Taylor Street - utility structures
Illinois St., from 16th St. to 23d St. - repaving
Lakeshore Park Subdivision No. 1 - utility occupancy plan
3d Street, vicinity Islais Creek Channel - utility occupancy
Lombard Street tunnels - plan and profile
3d Street widening, 18th Street to Custer Avenue - typical section
Army Street widening - Van Ness Avenue, South, to Bartlett Street - utility plan
Market Street intersection at 14th and Church Sts. - utility occupancy
Lakeshore Park Division No. 2 - utility occupancy plan
Lake Merced Boulevard, connecting with Junipero Sierra Boulevard utility occupancy plan
3d Street widening - hydrant relocation at 18th St.
Lincoln Way and Vicente sewer system - utility occupancy
Raycliff Terrace - utility occupancy

MARINA PUMPING STATION

This pumping station is fully automatic in operation. An operating engineer is in charge to attend to general maintenance and necessary minor repairs to the equipment.

During storms and power failures the high level of the sump is controlled by two methods: First, when the level of the sump has reached the danger point, the ringing of a buzzer located in a nearby fire-house and operated by remote control from the pumping station warns the fireman on duty that there is danger of the station flooding. Immediately the fireman proceeds to close a manually operated gate valve which in turn diverts the storm water to a large outfall sewer. The superintendent of pumping stations is then notified that the storm flow is being by-passed. The second control is a hydraulically operated emergency valve which closes when the sump level reaches elevation 11' 6".

COMMERCIAL STREET PUMPING STATION

The station is semi-automatic and is in charge of an attendant who is on duty during the day and takes care of general maintenance and minor repairs. The station serves a closed sanitary system, covering the district in the lower part of Market Street.

It was found necessary to install a new strainer basket. General overhauling and repairs were made to the pumping equipment during the year.

VICENTE PUMPING STATION

This station is fully automatic and is inspected daily by the superintendent of pumping stations. During times of storm the run-off is by-passed through a storm water overflow.

SEACLIFF PUMPING STATION NO. 2

This station was completed in March of this year and was placed in operation in April. An operating engineer is in charge in the daytime to take care of maintenance and miscellaneous minor repairs. In times of storm, the run-off is taken care of by an overflow storm sewer.

* * *

The following tabulations give the operating statistics of the pumping stations.

MARINA SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - 55,893

DISTRICT AREA - 1,025 ACRES

	PUMPAGE IN MILLION GALLONS:				Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day					
July 1940	132.6	4.348			25,210	$378.15	41.5	5,503	4.58
Aug.	130.8	4.289	No data Available		24,960	374.40		5,428	4.60
Sept.	130.8	4.289			25,170	377.55		5,428	4.64
Oct.	130.8	4.289			25,170	377.55		5,428	4.64
Nov.	128.4	4.210			24,620	369.30		5,329	4.62
Dec.	110.4	3.620			21,710	325.65		4,582	4.74
Jan. 1941	85.2	2.793			16,450	246.75		3,536	4.65
Feb.	133.8	4.387			25,980	389.70		5,553	4.68
Mar.	187.2	6.138			36,080	541.20		7,769	4.65
Apr.	147.0	4.820			28,270	424.05		6,101	4.64
May	97.8	3.207			18,700	280.50		4,059	4.60
June	108.6	3.561			20,180	302.70		4,507	4.49
Total Per Year	1,523.4	4.163	(Daily (Average		292,500	$4,387.50		63,223	4.63 (Average)

68% Average overall efficiency of each pump and its motor.

COMMERCIAL STREET SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA - 92.5 ACRES

	PUMPAGE IN MILLION GALLONS:								
Month	Total per Month	Daily average	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1940	11.52	.378			2,180	$43.60	26.5	305.3	7.13
Aug.	11.60	.380	No data Available		2,190	43.80		307.4	7.15
Sept.	11.42	.374			2,160	43.20		302.6	7.16
Oct.	13.40	.439			2,530	50.60		355.1	7.14
Nov.	13.05	.428			2,470	49.40		345.8	7.15
Dec.	15.30	.502			2,890	57.80		405.5	7.14
Jan. 1941	18.10	.593			3,420	68.40		479.7	7.14
Feb.	17.63	.578			3,330	66.60		467.2	7.14
Mar.	16.47	.540			3,110	62.20		436.5	7.16
Apr.	15.40	.505			2,910	58.20		408.1	7.16
May	14.57	.478			2,750	55.00		386.1	7.14
June	14.30	.469			2,700	54.00		379.0	7.14
Total Per Year	172.8	.472	(Daily (Average		32,640	$652.80		4,578	7.15 (Average)

44% Average overall efficiency of each pump and its motor.

VICENTE SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA 51.4 ACRES

Month	PUMPAGE IN MILLION GALLONS:				Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
	Total per Month	Daily aver-age	Max. per Day	Min. per Day					
July 1940	5.66	.186			2,110	$42.20	45	254.7	8.30
Aug.	6.08	.199	No data Available		2,270	45.40		273.6	8.32
Sept.	5.33	.175			1,990	39.80		239.9	8.32
Oct.	4.83	.158			1,800	36.00		217.4	8.31
Nov.	5.25	.172			1,960	39.20		236.3	8.31
Dec.	4.67	.153			1,740	34.80		210.2	8.30
Jan. 1941	4.42	.145			1,650	33.00		198.9	8.31
Feb.	6.42	.210			2,400	48.00		288.9	8.32
Mar.	6.08	.199			2,270	45.40		273.6	8.31
Apr.	6.88	.226			2,570	51.40		309.6	8.31
May	7.75	.254			2,900	58.00		348.8	8.31
June	5.08	.167			1,900	38.00		228.6	8.33
Total Per Year	68.5	.187	(Daily (Average		25,560	$511.20		3,081	8.31

38% Average overall efficiency of each pump and its motor.

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

During the year the Richmond-Sunset Sewage Treatment Plant continued to function satisfactorily and to fulfill its primary purpose of eliminating pollution of the shore waters and beaches.

For the year a gravity flow of 1,655.6 million gallons from the Richmond District, and a pumped flow of 1,058.0 million gallons from the Sunset District, for a total flow of 2,713.6 million gallons of sewage was treated by the plant. During storms the Sunset flow was by-passed to prevent overflow of storm sewers, and to avoid large quantities of sand being carried into the plant, and the Richmond flow limited to 18 million gallons per day by the storm water overflow.

The average daily flow for the year was 7.4 million gallons with wet and dry weather flows averaging 11.1 and 7.1 million gallons, respectively. A total of 9,960 cubic feet of screenings, 2,409 cubic yards of grit and 2,634 tons of dry sewage solids were removed, 3,332.4 tons of filter cake, amounting to 810.0 tons of dry solids were produced. Sludge delivered to City Parks for use as fertilizer amounted to 4,476 cubic yards of filter cake, with an estimated value of $16,700.

Bacteriological examination of the shore waters by the Department of Public Health, and visual examination for evidence of pollution have shown a notable improvement in the condition of the beaches along the ocean front, China Beach, and Baker's Beach.

Pre-Treatment

The bar racks were operated continuously, removing approximately 3.7 cubic feet of screenings per million gallons of sewage. A shorted 3/4 H.P. motor on the west bar rack was replaced with a 1 H.P. motor.

The grit-grease tanks operated continuously throughout the year. Grease removal was satisfactory, averaging approximately 1000 gallons of grease solution daily. Grit removal was not complete, however, some very fine sand being carried over to the mixing and sedimentation tanks. In order to minimize this as much as possible, the air diffusers were removed from the last bay of each tank. Some improvement resulted, but no permanent relief can be expected until the other two grit-grease tanks are equipped and put into service as originally planned. New shafting, impeller, and redesigned wearing rings were installed in the sand pump.

Sludge Control and Sedimentation

The flocculator and sedimentation tanks continued to function very efficiently during the year. Mean overall removal of suspended solids was 71% and of 5 days biochemical oxygen demand 55%. For the year, average suspended solids were 265 p.p.m.* for raw sewage, 75 p.p.m. for plant effluent; average biochemical oxygen demands were 270 p.p.m. for raw sewage, 120 p.p.m. plant effluent.

The sedimentation tank effluent troughs were leveled to equalize flow in each tank, and the flocculator tanks were drained, and sand removed twice during the year. Hinged doors were provided in the flocculating tank baffles to facilitate cleaning. Both sludge pumps were completely overhauled and fitted with impellers and wearing rings of new design, and shredder teeth in the screenings grinder were renewed.

Chlorination

Continuous pre-chlorination at a rate of 30 pounds per million gallons of sewage resulted in complete removal of characteristic sewage odors.

Post-chlorination was used continuously except during storms from March through November, and on week ends in December and January, at a variable rate from 60 to 120 pounds per million gallons of sewage to maintain an average residual of 0.5 p.p.m. after a contact period of five minutes.

Sludge Digestion

Throughout most of the year it was not possible to obtain stratification in the digester due to overloading. It is felt that only with the construction of a second unit will it be possible to get stratification, a heavier digested sludge, and a clearer supernatant. The amount of gas generated varied depending upon the rate of sludge addition. There was some leakage of gas through the digester seals, the metered production averaging about 0.7 to 0.8 cubic feet per capita of connected population.

An electrical circuit for automatically operating the seeding pump synchronously with sludge pumping was installed.

Elutriation and Sludge Filtration

All sludge withdrawn from the digester was washed in the elutriation tanks. The overall wash water ratio for the year was one volume of digested sludge to 2.5 volume of wash water. Alkalinity reduction was about 80% to an average of 470 p.p.m. in the elutriated sludge. Because of large volumes of thin sludge from the digester, some elutriated solids were carried over with the tank overflow and re-circulated through the plant.

The dewatering of sludge proceeded regularly throughout the year. An average dosage of 4.3% ferric chloride was required to properly condition the sludge, and the filter yield was approximately 5.0 pounds dry solids per square foot filter area per hour. The average life of filter cloths was approximately 1000 hours. The wear plate of the vacuum filter was refaced and new bridges

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*parts per million

installed, and motor bearings, coupling pins and bushings on the filtrate pump renewed. The sludge elevator frame was reinforced to prevent vibration.

Sunset Pumping Station

The plant was by-passed twice in the early part of 1941 to remove excessive deposits of sand. A schedule of periodic pumping down of the sump and flushing was instituted. No major sand handling trouble occurred thereafter.

The air blower vari-drive was completely overhauled, and new wearing rings installed in No. 1 sewage pump.

Laboratory

The laboratory made about 8,000 routine and special analyses to provide a continuous record of overall plant performance and efficiency. Daily composite samples of raw sewage and effluent were analyzed for suspended solids, and bi-weekly samples for 5 day biochemical oxygen demand. Raw sludge was analyzed daily for moisture content, and volatile solids; digested and elutriated sludge for specific gravity, moisture, volatile solids, alkalinity, and pH; and filter cake for moisture and pH. Other daily tests made were specific gravity of sludge gas and strength of ferric chloride solutions used for vacuum filtration. Chlorine residuals of chlorinated effluent were determined periodically, and monthly composites of filter cake analyzed completely for fertilizer constituents.

The laboratory proved to be of invaluable aid in the control of operation of the plant.

Miscellaneous Maintenance and Improvements

The proximity of the plant to the ocean creates especially severe atmospheric conditions leading to rapid deterioration f metal surfaces. All metal window frames and interior machinry, and piping in the Pre-Treatment and Mixing and Sedimentation uildings were painted during the year.

In the Main Building, a storeroom and an oil storage room ith six oil storage tanks were constructed. Steam radiators were nstalled in the machine shop and main switchboard room, and the nit heater removed from the laboratory to the vacuum filter oom. Cold water piping in the Elutriation room was insulated to revent condensation of water vapor.

A brick manhole was constructed to the sludge by-pass line o the Mile Rock sewer.

New macadam surfacing was laid providing additional parkng area and more paved access area to plant buildings.

The following tables summarize the main plant operating ata for the fiscal year:

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

COST OF OPERATION

Item of Expenditure	Total Plant Operation	Sewage Treatment with Chlorination	Sunset Pumping Plant	Sludge Disposal Conditioning & Filtration	Sewage Treatment without Chlorination
Permanent Salaries	$40,834	$23,766	$9,024	$8,044	$21,192
Temporary Salaries	1,685	986	371	328	854
Contractual Services	4,911	3,678	545	688	3,433
Heat, Light and Power	8,757	4,983	1,611	2,163	4,983
Plant Chemicals	12,302	9,733	-	2,569	-
Materials & Supplies	3,835	2,972	272	591	2,619
Total	$72,324	$46,118	$11,823	$14,383	$33,081

Richmond Flow	-	1,656 M.G.
Sunset "	-	1,058 "
Total		2,714

	Total Plant Operation	Sewage Treatment with Chlorination	Sunset Pumping Plant	Sludge Disposal Conditioning & Filtration	Sewage Treatment without Chlorination
Cost operation per M.G.	$26.65	$16.99	$4.36	$5.30	$12.19
Estimated cost per capita	$0.48 per yr.				

3,330 tons fertilizer, estimated value $16,700 delivered to City Parks during above period.

Additional Expenditures

Plant improvement	$1,000
Painting	2,166
Office Engineering	6,492
	$9,658

The Sunset Pumping Plant and the Vacuum Filter were not operated at all scheduled times. The Sunset flow has to be by-passed during storms to prevent back-up in the storm sewers, and to avoid large quantities of sand being brought to the sump. This results in decreased plant flow and less sludge to the digester and to the vacuum filter.

TABLE I - FLOW AND PRE-TREATMENT DATA

Month	Flow M. G.			Days By-passed		Screenings	Grease Gallons	Sand Cu. Yds.		Chlorination Lbs.	
	Richmond	Sunset	Total	Rich-mond	Sun-set	Cu. ft.	Pumped	Pre-Treatment	Sun-set	Pre	Post
July 1940	100.3	104.2	204.5	.01	.01	850	32,000	69	75	6,130	19,300
Aug.	91.5	91.6	183.1	5.64	5.82	700	26,600	55	69	5,490	15,030
Sept.	124.3	104.5	228.8	.02	.71	930	30,800	80	134	6,860	19,610
Oct.	110.6	94.3	204.9	2.98	5.14	870	28,500	85	128	6,140	18,080
Nov.	120.9	93.7	214.6	.72	5.58	875	27,300	81	182	6,440	17,680
Dec.	146.9	57.9	204.8	.72	14.98	865	22,400	85	75	6,140	2,590
Jan. 1941	207.0	41.7	248.7	.08	21.91	850	25,500	135	160	7,460	2,980
Feb.	109.2	7.9	117.1	12.37	26.47	415	12,800	88	24	3,510	-
Mar.	168.3	105.0	273.3	1.47	11.16	830	28,900	94	130	8,180	8,650
Apr.	167.0	110.4	277.4	.88	10.48	885	25,500	88	142	8,330	17,790
May	171.1	126.2	297.3	.01	2.46	970	27,900	96	173	8,800	24,170
June	138.5	120.6	259.1	-	-	920	27,000	72	89	7,760	20,050
	1,655.6	1,058.0	2,713.6	24.90	104.72	9,960	315,200	1,028	1,381	81,240	165,930

The Richmond flow was by-passed 1.59 days and the Sunset flow 90.33 days because of rain; the Richmond flow was by-passed 12.90 days while the Richmond Sewer Tunnel was cleaned, and in addition the Richmond flow was by-passed 10.41 days and the Sunset flow 14.39 days for sand removal from Sunset sump and flocculator tanks, power failure, plant alterations, and miscellaneous reasons.

Gallons of grease pumped is an approximate figure representing removals by water sprays from the surface of the grit-grease tanks. Additional grease is removed from the influent channel to flocculating tanks, and some from the surface of the sedimentation tanks directly by skimming to the thickening tanks.

Pre-chlorination has been at the rate of 30 lbs. per M.G. continuously throughout the year.

Post chlorination has been at the rate of 60 lbs. per M.G. from 2 A.M. to 8 A.M.; 80 lbs. from 8 A.M. to 10 A.M.; 120 lbs. from 10 A.M. to 1 P.M.; 100 lbs. from 1 P.M. to 3 P.M.; 80 lbs. from 3 P.M. to 5 P.M.; 100 lbs. from 5 P.M. to 2 A.M. During the winter season from December through March, post-chlorination was used only on Saturdays, Sundays, and holidays. Also there was no post-chlorination during by-passing of Sunset flow.

TABLE 2 - SLUDGE TO DIGESTER AND GAS PRODUCTION

	Raw Sludge To Digester					Gas Production Cu. Ft.			
Month	Gallons	% Water	Lbs. Dry Solids	% Volatile	Lbs Volatile	To Boilers	To Waste	Total	Digester Temp. °F.
July 1940	1,671,000	95.88	578,290	81.1	469,000	1,372,000	2,779,000	4,151,000	89
Aug.	1,211,400	95.86	420,930	81.9	344,700	1,216,000	2,171,000	3,387,000	90
Sept.	1,587,800	96.14	515,170	82.1	423,000	1,138,000	2,971,000	4,109,000	90
Oct.	1,521,300	95.94	519,330	83.3	432,600	1,131,000	3,004,000	4,135,000	90
Nov.	1,414,500	96.18	453,180	84.6	383,400	1,231,000	2,221,000	3,452,000	90
Dec.	1,121,800	95.98	379,240	83.0	314,800	1,535,000	1,472,000	3,007,000	87
Jan. 1941	815,100	95.96	277,760	78.4	217,800	1,215,000	1,043,000	2,258,000	92
Feb.	440,500	96.10	144,200	77.0	111,100	951,000	525,000	1,476,000	94
Mar.	1,414,400	96.29	441,000	79.2	349,100	1,199,000	1,836,000	3,035,000	89
Apr.	1,386,700	96.18	444,700	78.8	350,400	1,361,000	1,495,000	2,856,000	89
May	1,550,400	96.16	500,300	83.9	420,000	1,398,000	2,424,000	3,822,000	88
June	1,739,700	95.93	595,000	83.4	496,100	1,269,000	2,366,000	3,635,000	89
	15,874,600	96.04	5,269,100	81.8	4,312,000	15,016,000	24,307,000	39,323,000	90

The sludge from the sedimentation tanks is discharged at intervals through sight-feeds to thickening tanks, allowed to settle by gravity without mechanism. The supernatant is pumped to the incoming channel to mixing tanks and the thicker sludge to the digester. The rate of withdrawal of sludge from the sedimentation tanks and the number of withdrawals depend upon the flow and strength of sewage, averaging about 10 withdrawals per day. Sludge is pumped to the digester approximately six times per day.

During the winter months the per cent volatile of the sludge decreases materially and the quantity removed is much less than during normal operation.

TABLE 3 - DIGESTED SLUDGE TO ELUTRIATION TANKS

Month	Supernatant Gallons	Bottom Gallons	Average % Water	Lbs. Dry Solids	Average % Volatile	Lbs. Volatile	Lbs. Solids to Elut. / Lbs. Solids to Dig.
July 1940	*1,280,400	459,400	98.33	243,000	63.7	154,800	.42
Aug.	*833,400	378,000	98.44	158,100	63.1	99,800	.38
Sept.	*1,316,400	278,800	98.53	195,400	65.0	127,000	.38
Oct.	1,351,100	173,200	98.59	179,370	65.5	117,500	.35
Nov.	1,319,300	109,300	98.67	158,440	64.8	102,700	.35
Dec.	1,008,700	162,000	98.76	121,340	66.9	81,200	.32
Jan. 1941	580,000	166,300	98.92	67,360	63.3	42,600	.24
Feb.	404,000	48,200	99.23	28,990	60.4	17,500	.20
Mar.	1,016,300	123,000	98.87	97,600	59.2	57,800	.22
Apr.	1,069,200	399,400	98.44	190,500	55.6	105,900	.43
May	1,771,600	218,600	99.07	154,400	62.0	95,700	.31
June	2,169,000	41,900	99.11	191,040	66.2	126,500	.32
	14,119,400	2,558,100	98.71	1,785,540	63.2	1,129,000	.34

*Estimated

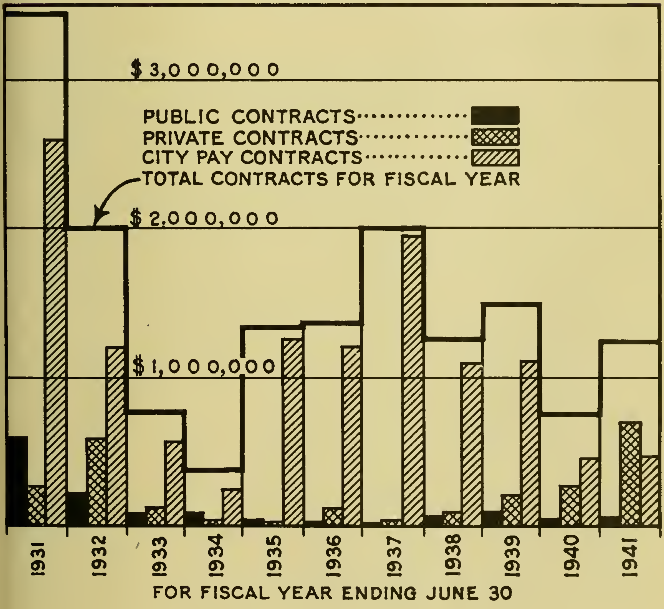
TABLE 4 - VACUUM FILTER OPERATION

Month	ELUTRIATED SLUDGE FILTERED Gallons x1000	% Water	Lbs. Solids x1000	Lbs. Fe Cl_3	% Fe Cl_3 on Solids	Hours Filter Operated	Lbs. Solids per Hour	Lbs. Solids per sq.ft. filter per hr.	Filter Cake % Water	Lbs. Cake x1000	Gallons Sludge Filtered per hr.	Lbs. Filtrate per hr. x1000	Cu. Yds. Cake to Park
1940													
July	771.9	96.58	221.5	11,430	5.16	203.00	1150	5.75	75.2	922.0	3,800	27.4	635
Aug.	515.1	96.66	144.4	6,650	4.60	131.90	1150	5.75	76.7	637.8	3,920	28.0	426
Sept.	525.1	96.54	152.7	7,000	4.58	133.16	1180	5.90	76.0	656.1	3,940	28.3	425
Oct.	550.6	96.58	158.0	7,790	4.92	146.58	1110	5.55	75.2	657.1	3,760	27.0	432
Nov.	573.4	96.38	174.5	7,190	4.11	164.58	1060	5.30	76.9	775.1	3,480	24.6	492
Dec.	545.6	97.05	135.0	5,970	4.43	148.61	930	4.65	75.3	561.6	3,670	27.0	414
1941													
Jan.	197.7	96.11	64.6	1,920	2.96	54.50	1210	6.05	74.0	252.7	3,630	25.8	166
Feb.	78.7	96.05	26.2	780	2.98	21.50	1240	6.20	71.8	95.4	3,620	26.4	52
Mar.	267.6	96.00	89.9	3,180	3.55	76.83	1190	5.95	72.0	326.8	3,480	25.1	195
Apr.	436.4	95.51	165.7	5,380	3.25	117.42	1450	7.25	71.8	601.2	3,710	26.3	416
May	407.2	96.39	123.3	4,710	3.82	105.75	1200	6.00	73.0	468.1	3,850	28.2	319
June	767.6	97.18	182.1	8,580	4.70	181.42	1040	5.20	73.5	710.8	4,230	31.6	504
	5,637.0	96.56	1,637.9	70,580	4.31	1,485.25	1130	5.65	74.8	6,664.7	3,790	27.4	4,476

WORK PERFORMED UNDER CONTRACT

Main Sewers		$147,499
Boulevards and Streets		
Paid by City	$324,578	
Public Assessment	70,380	
Private Contract	702,925	1,097,883
		$1,245,382

STREET WORK PERFORMED UNDER CONTRACT 1931 TO 1941 INCLUSIVE



STREET IMPROVEMENT ASSESSMENTS, ETC.

ASSESSMENTS AND BONDS FOR STREET WORK

Assessments issued for cost of street work performed	15
Cost of street improvements covered by assessments	$77,378.26
Bonds prepared (in triplicate)	17
Amount of assessments guaranteed by bonds	$ 2,624.27
Average amount guaranteed by each bond	$ 154.37
Receipts for bond payments issued	370
Amount of bond payments collected	$41,151.28

STREET WORK PROCEEDINGS

Resolutions of Intention passed	21
Street improvements recommended under Resolution of Intention	21
Notices of Street Improvement posted	497
Notices of Resolution of Intention mailed	592
Ordinances ordering performance of street improvements passed	22
Proposals for street improvements published	26
Awards of Contract for street improvements published	18
Notices of Recordation posted	271
Notices of Recordation mailed	371
Private contracts granted	62

NOTICES, PERMITS, AND INVESTIGATIONS

Notices to construct or repair sidewalks	2928
Notices to construct bulkheads	5

NOTICES, PERMITS, AND INVESTIGATIONS - CONTINUED

Notices to remove obstructions	434
Notices to obtain curb lowering permits	136
Notices to construct guard rails	9
Notices to obtain oil tank permits	7
Notices to replace side sewer trap covers	94
Notices to obtain street space permits	371
Street space permits reported on	1594
Oil tank permits reported on	26
House moving permits reported on	36
Miscellaneous calls and investigations	4580
Blasting bonds set and jobs supervised	4
Curb lowering permits	1479
Notices to reconstruct area walls, set back side sewer traps and oil tanks and reconstruct sidewalk doors in connection with the widening of the roadways of streets by reducing the sidewalk widths	1091

PERMITS AND FEES FOR CORPORATION TRENCHES

	Permits	Lin. Ft.	Fees
Pacific Gas & Electric Co.	3,611	120,875	$ 5,467.50
San Francisco Water Department	4,928	6,322	7,447.50
Pacific Tel. & Tel. Company	339	55,995	859.50
Postal Telegraph Company	-	-	-
Western Union	4	-	6.00

SPECIAL PERMITS

	Number	Fees
Oil Tanks	16	$ 55.50
Curb Lowering	1,371	5,722.50
Street Space	1,595	16,868.30
House Moving	35	70.00
Sub-sidewalk	-	-
Oil Tank Permits Reported on	14	-

DIVISION OF GRADES

Grades were designed, changed, and established on street in various sections of the city; some of these included street adjoining the following subdivisions:

Bridgeview Terrace
Geneva Terrace
Potrero Housing Project

Grade changes were made for the improvement of the follo ing streets:

Lombard Street, between Van Ness Avenue and Baker Street
Third Street, from Mariposa Street to Twenty-third Street
Miguel Street, from Fairmount Street to Beacon Street

Sidewalk changes consisted mainly of reduction in widt so as to provide additional roadway, and included the followin

Turk Street, from Market Street to Van Ness Avenue
Oakdale Avenue, from Bayshore Boulevard to the waterfront
Maple Street, from California Street to Sacramento Street
Lombard Street, from Van Ness Avenue to Baker Street
Also several streets in the heavy industrial district

Investigation and approval of grades, roadways, and sid walk widths were made for the following subdivisions:

Thornton Terrace
Park Manor
Sunnydale Manor

DIVISION OF SURVEYS

SURVEYS PERFORMED

For Public Contracts	40	
For Private Contracts	99	
Resurveys for Contracts	54	
For Municipal Departments	275	
Total for Public Improvements		468

LOT SURVEYS

For Private Owners	13	
For Municipal Departments	2	15
Total Surveys		483

Surveys covered approximately 1206 blocks and crossings, with a total of about 397,275 feet, or 75.25 miles, distributed as follows: 253,575 feet of line and grade points for new street and sewer construction; 22,300 feet of monument lines; 1830 feet for block resurveys; 4760 feet for W.P.A. Projects; 34,200 feet for subsidence and slides; and 80,600 feet for miscellaneous surveys which are listed below under their various titles. In addition, a total of 62.82 miles of precise levels was run and 2,499 bench marks were checked or reestablished; 82 monuments were either set, checked, referenced, or re-capped; there were 2 block resurveys which established block boundaries in reference to monument lines, and all improvements in these blocks were located.

Miscellaneous Surveys

Reconstruction of Municipal Railway Tracks on Geary Street from Fillmore Street to Lyon Street
Laguna Honda Station realignment of curb
Holloway Avenue Extension, from 19th Avenue to 1900 feet westerly abutting San Francisco State Teachers College Site
Third Street Widening from Channel Street to 23d Street

Clipper Street Extension
Bayshore Boulevard, resurfacing from Waterloo Street to Islais Creek Channel
Monterey Boulevard survey for reconstruction study
Alemany Boulevard survey for sewer and resurfacing from Bayshore to Mission Street viaduct
Evans Avenue bridge at Army Street, survey for study and plans
Great Highway, wave action and beach protection
Aquatic Park, soundings for beach treatment
Lincoln Way sewer Extension to Great Highway
Beacon Street and Miguel Street, construction of street walls
Potrero Housing Project, examination of streets for acceptance
Treasure Island Road, proposed, connecting San Francisco Bay Bridge and the Island
Seacliff Pumping Plant, north of Seacliff Avenue
O'Shaughnessy Boulevard - road and sewer construction
Clipper Street Extension
Lombard Street widening, from Broderick Street to Van Ness Avenue
Nineteenth Avenue Extension
Bernal Heights Boulevard
United States Post Office at Mission, Spear, Steuart, and Howard Streets
Lake Merced Lands, profile levels for sewer study
Metropolitan Subdivision Project, traverse for sewer
High Pressure Water Mains, survey and elevations where mains cross sewers on piles

Subsidence and Slides

Parker Avenue slide on Parker Avenue
Anza Street at Lone Mountain
Kirkwood Street and Mendell Street
O'Shaughnessy Boulevard, opposite Encline Court
North Point Sewage Disposal Plant Site - proposed
Eighteenth Street and Hattie Street
Market Street and Glendale Street
Bernal Avenue, from Randall Street to Saint Mary's Avenue
Safety Islands, surveys for those to be constructed

Surveys for W.P.A. Projects - Reduction of Walks

Post Street from Scott Street to Presidio Avenue; Presidio Avenue from Post Street to Geary Street
Bryant Street, from Tenth Street to Eleventh Street
Howard Street and South Van Ness Avenue, from Ninth Street to Fourteenth Street
Maple Street, from California Street to Sacramento Street

Surveys for other W.P.A. Projects

Howard Street and South Van Ness Avenue, from Ninth Street to Nineteenth Street - Construction of sewer
O'Shaughnessy Boulevard - Road and sewer construction
Police Department Recreational Field, Intersection of Skyline Bou levard and Lake Merced Boulevard - Survey for Contour Map

PRECISE LEVELS AND BENCH MARKS

District	Bench Marks	Distance - Miles
Richmond	437	8.35
Sunset	278	5.88
100 Vara	120	5.23
Mission	187	7.63
Western Addition	269	5.80
Sunnyside	98	2.81
Potrero	568	12.38
Ocean View	169	5.24
Miraloma Park	81	1.86
Visitacion	85	2.88
50 Vara	131	3.12
Other Districts	76	1.64
Total Bench Marks Checked and Reestablished	2,499	Total Miles - 62.82

APS APPROVED AND FILED

pening of Kern Street - Diamond Street and Brompton Avenue
pening of Masonic Avenue - Between Upper Terrace and Loma Vista Terrace
ubdivision No. 3 - Lakeside
otrero Low Rent Housing Project showing street opening
pening of Golden Gate Avenue - Between Masonic Avenue and Parker Avenue
orrected location of Copper Alley between Market Street and Corbett Avenue
mended map of Block 5354a - Fernando Nelson's Subdivision of Silver Terrace
pening of Ord Court from Ord Street
hornton Terrace
idening of Nineteenth Avenue from Lincoln Way to Sloat Boulevard
ealignment of Corbett Avenue from Clayton Street to 24th Street and Graystone Terrace from Corbett Avenue northwesterly, also the widening of Iron Alley and Romain Street
pening of Cutler Avenue from 47th Avenue to Great Highway
xtension of Oneida Avenue, between Cayuga Avenue and Alemany Boulevard
ark Manor
elocation of Shoup Avenue between Yosemite Avenue and Egbert Avenue; the widening and relocation of Mendell Street between Williams Avenue and Carroll Avenue; the widening of Williams Avenue between Newhall Street and Lucy Street; and the widening of Wallace Avenue from 3d Street to 240 feet westerly
pening of Mint Street and Jessie Street
xtension of 26th Street from Kansas Street to Vermont Street
idening of Division Street from Ninth Street to Eleventh Street
xtension of Tenth Street from Division Street to Potrero Avenue
xtension of Eleventh Street from Bryant Street to Division St; also the closing of Hampshire Street from Alameda Street to Division Street

MAPS APPROVED AND FILED - Continued

Sunnydale Manor
Widening of the northwesterly termination of Waterville Stree
Extension of 15th Avenue north of Lake Street
Extension of Conkling Street from its northerly termination t
Thomas Avenue, and the district bounded by Silver Avenu
Augusta Street, Waterville Street, Selby Street, an
Thomas Avenue

FEES RECEIVED FOR SURVEYS

1940	
July	$1,004.45
August	1,105.00
September	624.00
October	1,798.13
November	1,633.60
December	3,673.40
1941	
January	1,868.47
February	295.67
March	804.56
April	532.08
May	205.00
June	1,313.52
Total -	$14,857.88

FFICE WORK

In connection with and in addition to the foregoing, the ffice work included the following:

Data for the use of the surveyors in the field is computed nd compiled in the office for each survey. From field surveys, onument lines are adjusted and monument maps drawn. Maps are rawn of street widenings, openings, closings, extensions, etc., hich are filed in the office of the City and County Recorder. ll recorded maps showing changes are furnished the Assessor's ffice for assessment purposes.

The 1" = 100' scale maps of the City and County, made up f 354 sheets, are kept up to date, showing all official data on treet name changes, on street openings and closings, extensions, idenings, and all property acquired or sold by the City and ounty of San Francisco.

All appeals from the decision of the City Planning Comission in the matter of zone changes presented to the Board of upervisors are checked to determine the total area of property epresented by the signers of such appeals.

All actions to quiet title, referred to the City Attorney, re checked to determine whether any City and County property is nvolved in such actions.

Other office work consists of computing, writing, and hecking all property descriptions for the Real Estate Departent; investigating and checking maps of proposed real estate ubdivisions, and also checking street descriptions for dedicaion purposes; answering petitions; making estimates; and furishing information to the various municipal departments and to rivate engineers and surveyors, in addition to answering inquiies made by the public to the office of the Division of Surveys.

CURRENT CONTRACT DATA 1940-1941

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Amount	Expended	Fund
			Date	%		to 6/30/41	
			BOULEVARDS, PAVING, GRADING, ETC.				
Alemany Boulevard and Justin Dr. Intersection	Eaton & Smith	9/13/40	12/9/40	100	$1,693.67	$ 1,693.67	1927 Boulevard Bonds
Army St., between Evans Ave. and Mississippi St.- Traffic Safety Island	Adam Arras & Son	1/31/41	4/1/41	100	2,438.00	2,438.00	Spec.Gas Tax Street Improvement
Bayshore Boulevard, from Waterloo St. to Islais Creek Channel	Chas. L. Harney	9/13/40	2/28/41	100	19,702.31	19,702.31	1927 Boulevard Bonds
Brunswick St. between Allison Street and Guttenberg Street	Eaton & Smith	1/3/40	6/6/41	100	10,435.80	5,217.90*	Public Assessment & County Roads
Edward St., between Arguello Blvd. and Willard St., and Westerly 1/2 of Willard St. between Turk and Edward Streets	Eaton & Smith	12/20/39	8/23/40	100	4,490.22	3,237.41*	Public Assessment & County Roads
El Camino del Mar in Lincoln Park	Eaton & Smith	1/10/41	3/26/41	100	3,528.20	3,528.20	Spec.Gas Tax Street Improvement
Golden Gate Heights Paving Contract No. 3	Union Paving Co. (Assignee of	3/28/41	12/3/41	100	18,734.12	9,702.87*	Public Assessment & County Roads

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Amount	Expended to 6/30/41	Fund
			Date	%			
BOULEVARDS, PAVING, GRADING, ETC. - Continued							
Hahn Street, between Visitacion Avenue and a point 584 feet south of Sunnydale Avenue	Chas. L. Harney	11/8/40	4/3/41	100	$24,481.21	$ 6,594.57*	Public Assessment & General
Market St. and Clayton St. - Safety Island	Chas. L. Harney	4/25/41			7,655.87		Spec.Gas Tax Street Improvement
Miguel Street, Beacon Street, and Harry Street	Eaton & Smith	11/1/40	6/30/41	13.4	22,410.79	1,600.00*	Public Assessment & County Roads
Nineteenth Ave. and Holloway Ave.-Intersection	Eaton & Smith	3/14/41	6/10/41	100	1,803.33	1,803.33	1927 Boulevard Bonds
Ninth St., between Market and Division Streets	Chas. L. Harney	6/19/40	1/20/41	100	78,732.32	78,732.32	Spec.Gas Tax Street Improvement
Planing Bituminous Pavement Surfaces, Contract No. 2	Wells, The Planer	5/21/41	6/30/30	12	18,267.60	2,184.00	Spec.Gas Tax Street Improvement
Polk St., between McAllister St. and Turk St.	Chas. L. Harney	7/5/40	10/16/40	100	5,179.72	5,179.72	Spec.Gas Tax Street Improvement

CURRENT CONTRACT DATA 1940-1941

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/41	Fund
BOULEVARDS, PAVING, GRADING, ETC. - Continued							
Portola Drive Widening, between Sydney Way and Waithman Way	Chas. L. Harney	4/3/40	8/13/40	100	$14,957.58	$14,957.58	Spec.Gas Tax Street Improvement
Portola Drive, between 25th Street and 26th Street	Fay Improvement Company	7/3/40	9/24/40	100	5,083.75	5,083.75	Spec.Gas Tax Street Improvement
Post St., between Taylor Street and Van Ness Avenue	M. J. Lynch	12/27/40	5/16/41	100	39,361.72	39,361.72	Spec.Gas Tax Street Improvement
Potrero Housing Project Improvement of Adjacent Streets	Chas. L. Harney	8/23/40	1/16/41	100	11,801.69	1,612.17*	Public Assessment & County Roads
Quintara Street, between 22d Ave. and 24th Ave.; 24th Ave., between Quintara St. and Rivera St.	Fay Improvement Company	9/9/40	4/8/41	100	26,725.09	15,676.00*	Public Assessment & County Roads
Santos Street, between Velasco Street and a point 275 feet southerly	Chas. L. Harney	1/24/41	6/30/41	70	8,115.52	2,500.00*	Public Assessment & County Roads
Sequoia Way, Westerly 1/2 between Omar Way and	Eaton & Smith	5/17/40	12/9/40	100	2,766.35	2,766.35	County Roads

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/41	Fund
		BOULEVARDS, PAVING, GRADING, ETC. - Continued					
Silver Avenue Extension, between Quesada Avenue and Palou Avenue	Chas. L. Harney	5/17/40	10/10/40	100	$4,993.11	$4,993.11	General
Silver Avenue, between Thomas Avenue and Quesada Avenue	Eaton & Smith	5/24/40	2/19/41	100	17,465.19	13,575.17*	Public Assessment & County Roads
State Highway Routes #2, #55, #56, and #68 Repair of pavements	Eaton & Smith	6/18/41			9,155.00		State Highway Trust
Third Street, between Mariposa St. and 23d Street	Chas. L. Harney	4/4/41	6/30/41	9.6	124,418.70	12,000.00	Spec.Gas Tax Street Improvement
24th Avenue, between Ortega Street and Quintara Street	Chas. L. Harney	3/26/41			21,606.63		Public Assessment & County Roads
25th Avenue from Fulton St. to El Camino Del Mar (Planing Bituminous Pavement Surfaces)	Wells The Planer	2/21/41	4/22/41	100	3,358.37	3,358.37	Spec.Gas Tax Street Improvement

CURRENT CONTRACT DATA 1940-1941

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/41	Fund
			BOULEVARDS, PAVING, GRADING, ETC. Continued				
30th Avenue, between Pacheco Street and Quintara Street	Chas. L. Harney	6/14/40	9/30/40	100	$2,936.14	$ 113.53*	Public Assessment & County Roads
36th Avenue between Quintara St. & Santiago St.; 37th Ave., between Rivera St. & Santiago St.	DeLuca & Son, Inc.	3/1/40	5/3/40	100	1,725.12	1,725.12	1927 Boulevard Bonds
37th Avenue, Easterly 1/2 between Lawton St. and Moraga Street	Eaton & Smith (Assignee of E. J. Treacy)	4/10/40	10/9/40	100	3,940.00	3,940.00	County Roads
37th Avenue, Easterly 1/2 between Noriega St. and Ortega Street	Chas. L. Harney	7/26/40	1/17/41	100	3,558.00	3,558.00	County Roads
38th Avenue, between Taraval Street and Ulloa Street	Fay Improvement Company	1/29/41	6/30/41	100	13,300.93	3,860.53*	Public Assessment & County Roads
			SEWERS				
Alemany Boulevard from Crescent Avenue to Bay-	Eaton & Smith	7/10/40	12/13/40	100	37,658.54	37,658.54	1927 Boule-

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/41	Fund
			SEWERS - Continued				
Clarendon Avenue and Laguna Honda Boulevard	Fay Improvement Company	10/4/40	11/1/40	100	$1,133.76	$1,133.76	General
Hassler Health Home - Sewage Treatment Plant	Albert E. Mangs & Associates	2/13/40	7/31/40	100	32,946.00	32,946.00	1938 Hospital Bonds - P.W.A.
Lake Merced Sewer Trestle Replacement	Martinelli Construction Co.	4/19/40	7/31/40	100	9,689.12	9,689.12	General
Oakdale Avenue, between Patterson St. and Barneveld Ave.- Furnishing and driving piles for sewer	Healy-Tibbits Construction Co.	3/21/41	6/30/41	100	6,303.28	6,303.28	General
Richmond-Sunset Sewage Treatment Plant - Walkways, handrails, partitions	Walter Lenkeit	7/1/40	8/30/40	100	2,440.00	2,440.00	General
Seacliff Sewage Pumping Station No. 2	C.C.W. & H.H. Haun	5/31/40	3/16/41	100	57,277.79	57,277.79	General
			MISCELLANEOUS				
Alemany Boulevard, south of College Ave. - Protection wall - Slope repair	Walter Lenkeit	9/4/40	10/7/40	100	985.00	985.00	1927 Boulevard Bonds

CURRENT CONTRACT DATA 1940-1941

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/41	Fund
		MISCELLANEOUS - Continued					
Anza Street, between Parker Ave. and Collins Street - Test Borings	Robert Garcia	11/22/40	1/14/41	100	$1,458.00	$1,458.00	Spec. Gas Tax Street Improvement
Aquatic Park - Mooring dock	A. W. Kitchen & Company	9/18/40	4/1/41	100	17,805.98	17,805.98	General
Bernal Avenue Slope Repair	Chas. L. Harney	10/18/40	6/30/41	90	13,600.38	12,223.00	1927 Bernal Bonds
Great Highway Protection near Taraval Street	C. W. Caletti & Company	2/26/41	6/30/41	7.4	67,675.00	5,018.00	Spec. Gas Tax Street Improvement
16th Avenue and Presidio Wall - Slope Repairs	E. J. Treacy	10/23/40	12/21/40	100	3,369.00	3,369.00	County Roads
37th Avenue, between Noriega St. and Ortega St. - Sand Removal	Piombo Bros. & Company	6/12/40	8/2/40	100	1,160.00	1,160.00	County Roads
38th Avenue, between Noriega St. and Ortega St. - Sand Removal	Piombo Bros. & Company	7/26/40	9/8/40	100	1,970.00	1,970.00	County Roads

INFORMAL CONTRACTS

COMPLETED DURING FISCAL YEAR 1940-1941

cation	Type of Work	Amount	Fund
uatic Park	Concrete steps	$790	General
" "	Timber groins	227	General
" "	Repairs to wall	80	General
uatic Park Beach	Brick and debris removal	586	General
ueprint Room	Install stainless steel sink	265	General
rst Street, between rrison Street and yant Street	Improvement	958	County Road
urteenth Avenue, rth of Lake Street	Center Island removal	472	County Road
endale Street d Market Street	Test Borings	528	General
endale Street d Market Street	Drain	714	General
eat Highway, between ntiago Street and lloa Street	Test borings	233	Spec. Gas Tax Street Improvement
eat Highway, between raval Street and ntiago Street	Guard rail installation	611	County Road
hn Street and nnydale Avenue - tersection	Sewer	87	General
ssler Health Home	Paving Parking area	641	Hospital bonds
ighland Avenue and ichland Avenue - ridges over Bernal Cut	Miscellaneous repairs	712	Spec. Gas Tax Street Improvement
aidley Street Slide etween Mateo Street d Roanoke Street	Cleaning and oiling slide	149	County Road
ineteenth Avenue ear Estero Avenue	Concrete supports for sewer	485	1927 Boulevard bonds
ichmond Sewer Tunnel 4th Avenue and ake Street	Ventilating System	646	General

INFORMAL CONTRACTS - Continued

Location	Type of Work	Amount	Fund
Richmond-Sunset Sewage Treatment Plant	Insulation of piping	$ 83	General
Sequoia Way and Bella Vista Way	Catchbasin	140	General
Thirty-third Avenue between Noriega Street and Ortega Street	Improvement	290	County Roa
Twentieth Street and Carolina Street; Porter Street and Benton Avenue	Guard Rail Installation	306	County Roa
Thirty-sixth Avenue and Ortega Street Crossing	Improvement	890	General

(These items refer to plans and specifications and not to actual construction)

Major Divisions	APPROXIMATE COST Plans and Specifications Complete	 Plans and Specifications Under Way
Boulevards (1927 Bonds)	$ 13,600	$ 50,000
Bridges - Second one-quarter cent gasoline tax		
Estimates, Investigations and Reports		
Joint Highways		
Map		
Miscellaneous Plans (County Roads)	225	226,500
Sewers, Extensions & Pumping Stations		
One-quarter cent Gasoline Tax - State Highways	33,262	60,000
One-quarter cent Gasoline Tax - Major Streets	269,966	6,958,449
Special Improvements (County Roads)		14,610
Tax Rate Plans	9,729	1,995
Traffic Engineering Section	25,484	60,000
	$352,266	$7,371,554

DIVISION OF DESIGN

These items refer to plans and specifications and not t actual construction.

BOULEVARDS, STREETS AND HIGHWAYS	Contract Plans		Lands
	Complete	Under Way	(Estimat
Alemany Boulevard - Sec. "A" Bayshore Blvd. - Mission St.	$ 1,600	$ 50,000	$
Bernal Cut (Bond Issue)	12,000		
STATE HIGHWAYS (One-Quarter Cent Gasoline Tax)			
Lombard St. Widening	314,500		954,0
Traffic Striping, Route #56	95		
" " " 2	194		
Minor Improvements " 2	169		
" " " 56	165		
" " " 68	13		
Maintenance by Repair Routes Nos. 2, 55, 56 & 68	9,726		
19th Avenue - Traffic	22,900		
Bayshore Blvd. - Traffic		60,000	
MAJOR STREETS (One-Quarter Cent Gasoline Tax)			
Anza Street Widening	1,368	70,000	90,0
Army St.-Mississippi St. Third Street Wall	4,160		
Bryant St.-Division St. to Army Street		12,800	22,0
Clipper St. Extension		125,000	20,0
El Camino Del Mar in Lincoln Park	6,400		
Geneva Ave. Extension		20,000	62,0
Great Highway Studies	68,000		
Marina Blvd.-Lyon St. to Laguna Street		100,000	
Market St.-Clayton St. Safety Zone	7,600		
Market St.-Portola Drive	22,200	2,038,000	51,0
O'Shaughnessy Blvd.-Slide		30,000	
Persia Ave. Extension		10,000	37,0
San Jose Ave.-Army St. and Brooks St.		107,000	500,0
Santa Rosa Avenue Grade Separation		22,000	

JOR STREETS - Continued	Contract Plans Complete	Contract Plans Under Way	Lands (Estimated)
xth St.-Brannan St. to Third St.	$	$2,465,000	$535,000
anley Drive-Alemany Blvd. to Junipero Serra Blvd.		130,000	20,000
nset Blvd. Crossing Golden Gate Park		236,000	
ird St. Widening	126,074	600,000	268,000
umbull Street		60,000	50,000
bster St. Extension		10,000	50,000
ans Avenue Bridge		42,000	
urth Street Bridge	30,574		
lais Creek Bridge		800,000	
xth Street Bridge		6,700	
anley Drive Underpass		160,000	
ird Street Bridge	500	70,549	
scellaneous Bridge Repairs	795	2,400	
affic Striping	2,295		
WERS, RICHMOND-SUNSET SEWAGE EATMENT PLANT, AND SEWAGE PUMPING STATIONS			
tension and Reconstruction - Main Sewers			
arendon Ave. and Laguna Honda - Drainage	1,360		
endale Street near Market Street - Drainage	764		
de Street Outfall Sewer Extension	1,003		
kdale Avenue Sewer	5,680		
chmond Plant - Maintenance	276	1,395	
chmond Sewer Tunnel - Ventilating System	646		
nelake Park Pumping Station		600	

ESTIMATES, INVESTIGATIONS, AND REPORTS

Aquatic Park Seawall
Blueprint Room Sink
Fire Department Pumping Station
Hassler Health Home Drainage
Holly Park Fire House
Legion of Honor Cistern
Legion of Honor Sewer
Potrero Police Station
Sewage Plant, Golden Gate Park
Visitacion Community Center

SPECIAL IMPROVEMENTS
County Roads

	Contract Complete	Plans Under Way
Parker Avenue Slide		$ 224,000
Laidley Street Slide	$225	2,500
Engineering Studies for which no Special Appropriations had been made:		14,610

- Alpha Street - Tioga Ave. - Tucker Ave.
- Aquatic Park - Experimental Groin
- Army Street - Railings
- Automobile Terminal
- Bay Bridge Ramp - Realignment
- Bayshore Boulevard - Set backs and rezoning
- Beach Protection - Preliminary Study
- Belt Line Highway
- Bridge View Drive
- Brussels Street Slide
- Budget 1941-1942 - Estimates
- California Street - Side Sewers
- Christmas Tree Point
- Comprehensive Highway and Drainage Plan
- De Haro Street and 25th Street
- Estimate of Sewer Complaints
- Emergency Reports, Articles and Programs
- Francisco Street and Larkin Street - Pavement
- Fremont School - Retaining Wall
- Glendale Street Drainage
- Glendale Street and Market Street - Testing Borings
- Holloway Avenue Extension
- Kirkwood Avenue and Mendell Street - Slide Investigation
- Marina Boulevard and Cervantes Boulevard
- Market Street and Grand View Avenue - Slide
- Miguel Street and Beacon Streets (Retaining Walls)
- New Subdivision Approval for Sewers, Traffic, Electrical, e
- O'Shaughnessy Boulevard Slide #2 - Encline Court
- Pavement Burning
- Pavement Planing
- Pile Records
- Street opening and closing
- Surface Drainage Standards

CIAL IMPROVEMENTS - Continued

ineering Studies for which no
ecial Appropriations had been
e - continued:

Soil Augers - Plans
Standards - Design of Sewers
Thirteenth Street - Safety Island
Underground Interferences
Victoria Street Curb Set back

TIMATES, INVESTIGATIONS, AND REPORTS	Status
int Highway No. 10 Junipero Serra Boulevard Extension Sec. #2 - Cypress Lawn to Sneath Road	Under Way
Junipero Serra Boulevard Extension Sec. #3 - Sneath Road to Burlingame	Under Way

PPING

derground Structures	Under Way

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ANNUAL REPORT

of the

BUREAU OF ENGINEERING

of the

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF
SAN FRANCISCO

Fiscal Years Ending June 30, 1942, and 1943

ANGELO J. ROSSI, *Mayor*

THOMAS A. BROOKS, *Chief Administrative Officer*

H. C. VENSANO, *Director of Public Works*

JOHN J. CASEY
City Engineer

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REPORT OF THE BUREAU OF ENGINEERING

1941-1942
and
1942-1943

DEPARTMENT OF PUBLIC WORKS

City and County of
San Francisco

JOHN J. CASEY
City Engineer

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

ADDRESS ALL COMMUNICATIONS TO THE
CITY ENGINEER

IN YOUR REPLY, REFER TO FILE:

September 30, 1943

Mr. H. C. Vensano, Director
Department of Public Works
City and County of
San Francisco, California

Dear Sir:

Herewith I transmit the annual reports of the Bureau of Engineering for the fiscal years ending June 30, 1942, and 1943.

Lombard Street between Van Ness Avenue and Richardson Avenue has been improved by the widening and construction of new divided roadways. This street is part of the highway system within the City and serves as a traffic feeder to the Golden Gate bridge.

A new interlocking steel pile seawall has been built along the Great Highway near Taraval Street replacing the old wood bulkhead which had been damaged by storms.

During the past two years a program for planing pavement surfaces covered a large number of streets, boulevards, and several highways within the City.

The old floor, pavement, and rails on the Fourth Street bridge over Channel Street Waterway were removed and a new steel open deck grating constructed.

A new five-foot diameter brick sewer was built on Jackson Street between Battery and Sansome Streets. This is the first all-brick sewer constructed in San Francisco in 42 years. Five other sewer and drainage projects were completed during the year.

Complete summaries of operation and maintenance for the Richmond-Sunset Treatment plant and sewage pumping stations are included in this report.

Yours respectfully,

John J. Casey
John J. Casey
City Engineer

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ORGANIZATION AND PERSONNEL

John J. Casey	City Engineer
S. P. Duckel	Assistant City Engineer
W. C. Pidge Surveys, Street and Sewer Design and Construction, Street Assessments, Permits and Complaints	Engineer of Street Improvement Investigations
W. H. Ohmen Special City Projects, Boulevards Sewers, Sewage Disposal, Bridges, Tunnels, Auxiliary Water Supply	Chief Civil Engineering Designer
C. H. Stern	Chief Surveyor
C. M. Taylor Supervising Construction (Major Projects)	Chief Civil Engineering Inspector
F. O. Shutts Supervising Construction (Minor Projects)	Chief Civil Engineering Inspector
L. Glick Contract Estimates and Payments Personnel and Office Administration Records	Office Engineer
G. W. Purser	Traffic Engineer
K. Fraschina Richmond-Sunset Sewage Treatment Plant	Superintendent

ROLL OF HONOR

Armed Forces

Lawrence J. Archer
Benjamin Benas
Joseph Corrao
William R. Daly
Darrell D. Davis
Llewellyn De Cew
Clifford J. Geertz
Stanley C. Gerughty
James T. Hester
Charles S. Hiden
Jess L. Ingram
Peter D. McCarthy
Milton P. Peyre
Ivan Sandberg
Thomas L. Skillington
John L. Slater, Jr.
Michael F. Sweeney
George E. Westlund
Fred Winters
Herman J. Zimmerman

U. S. Merchant Marine

Wilfred S. Balk
Raymond K. Burton
Frank Coleman
Robert P. McGlothin
John B. Pugh
Ralph R. Sotter

BOULEVARDS, STREETS, AND HIGHWAYS

BOULEVARD CONSTRUCTION OUT OF BOND ISSUES

Bernal Avenue (West side) Slope Repair

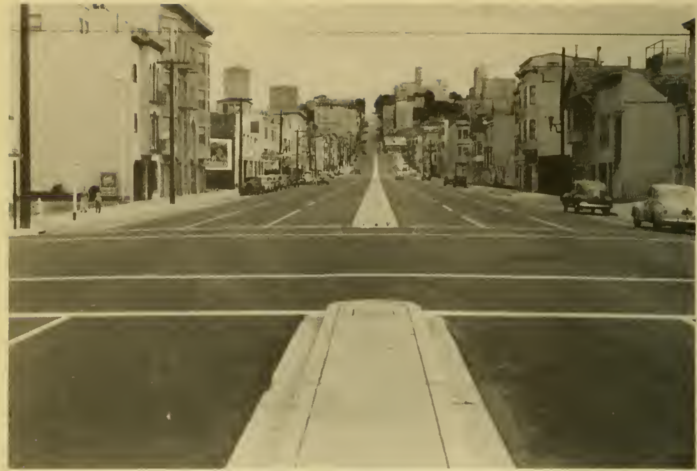
Between Mateo and Fairmount Streets. The work included the construction of timber baffles with metal anchors, concrete headwall, and rubble apron; the installation of 4-inch unperforated metal drains and 4-inch lateral perforated drains which were covered with crushed rock. Slope areas between the southerly lines of Fairmount and Mateo Streets where erosion had occurred were restored to original slope line. The slope and berm areas, except for existing plant growth, were re-planted. The work was finished January 2, 1942, contract cost being $13,600.

HIGHWAYS OUT OF STATE HIGHWAY TRUST FUND*

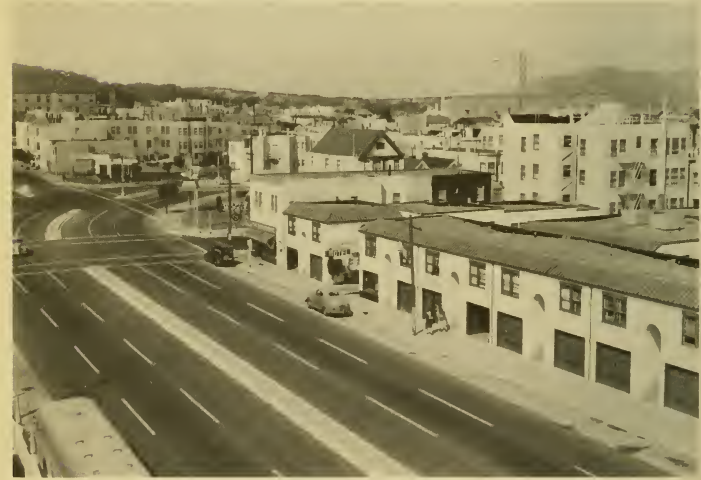
Nineteenth Avenue Park-Presidio Boulevard

On December 12, 1941, a contract was awarded for a complete traffic signal system to be installed on State Highway Route #56, along Nineteenth Avenue from Junipero Serra Boulevard to Lincoln Way, thence across Golden Gate Park, and from Fulton Street along Park-Presidio to Lake Street. The work completed on this contract includes the following installations: 122 foundations for concrete standards, 109 standards, conduits, street lighting cables, junction boxes, and pull boxes. Concrete safety islands, traffic islands and center islands, together with some incidental paving have been constructed. On November 3, 1942, the contract was terminated at a cost of $48,724 because of inability to obtain certain critical materials, such as controllers, cables, and appurtenances for the signal system. The original contract price was $75,000.

*First One-Quarter Cent Gasoline Tax



Lombard Street
Looking east from Laguna



Lombard Street
Connection with Richardson Avenue
Looking west

Lombard Street

The widening and reconstruction of Lombard Street between Van Ness Avenue and Richardson Avenue have been completed. This street, a part of State Highway Route #2, serves as a connection between the approaches of the San Francisco Bay bridge and the Golden Gate bridge for all types of vehicular traffic. It is a direct route to and from the Golden Gate bridge for the shopping, financial, commercial, and industrial districts of the City. Additional property was acquired for the widening of the street, making a total width of 100 feet. The cross-section consists of two 38-foot roadways, separated by a raised center strip four feet wide, and two 10-foot artificial stone sidewalks. The roadways were paved with 8-inch hydraulic concrete and 2-inch asphaltic concrete wearing surface. Two 7-foot concrete parking lanes were constructed monolithic with new white cement curbs. The center strip was paved with 3½-inch concrete pavement.

Sewers, consisting of 12", 15", 18", and 24" vitrified clay pipes, were constructed, together with the manholes, side sewers, catch-basins, and appurtenances.

This street is in the underground district and all overhead light, telephone, and power lines will be installed underground in conduits. Electrical work included installation of conduits, concrete junction and pull boxes, electrical stop signs, and one traffic beacon. The street signs, directional signs and traffic signals were relocated. High-pressure and low-pressure hydrants and valves were moved to new locations as required.

The total length of the project is twelve blocks, or a distance of 5,760 feet. Construction was completed on May 23, 1943, contract cost being $289,039.

State Highway Repairs

The existing cracks and broken patches in the wearing surfaces were filled and sealed by the use of sand, rock and emulsified asphalt on the following state highways within the City: Alemany Boulevard from San Jose Avenue to Mission Street; Sloat Boulevard from 39th Avenue to 19th Avenue; 19th Avenue from Junipero Serra Boulevard to Lincoln Way; Park-Presidio Boulevard from Fulton Street to Lake Street; Bay Shore Boulevard from the County Line to Army Street; Junipero Serra Boulevard from the County Line to 19th Avenue. Contract cost, $7,637; completed November 10, 1941.

MAJOR STREET CONSTRUCTION AND RECONSTRUCTION OUT OF "SPECIAL GASOLINE TAX STREET IMPROVEMENT FUND"*

Visitacion Avenue Extension

Between Hahn and Dublin Streets. Improvements included the construction of unarmored concrete curbing, 2½-inch asphaltic wearing surface on the existing macadam base, Oregon pine headers, brick catch-basins and 10-inch vitrified clay pipe culverts. Contract cost, $14,983; completed May 22, 1942.

Oakdale Avenue

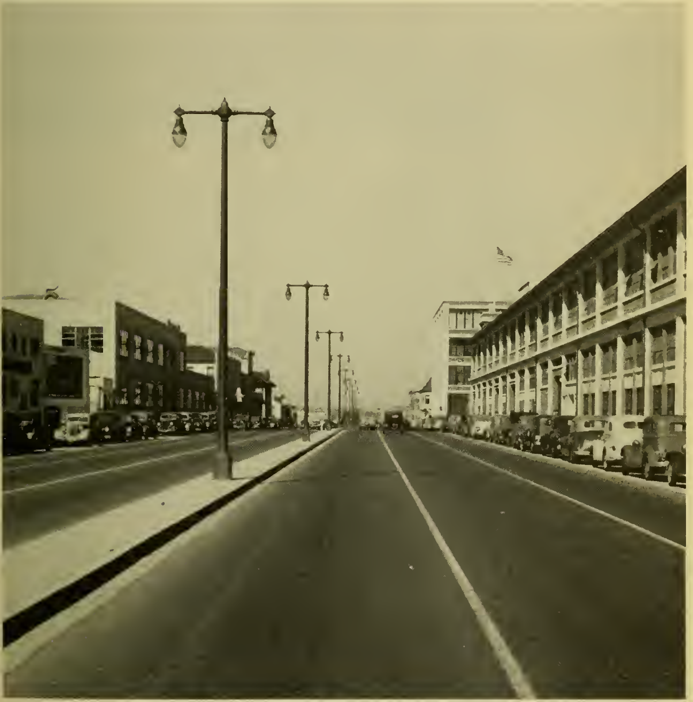
Between Bay Shore Boulevard and Selby Street. The roadway area, which has heavily subsided, was filled to sub-grade, one foot below pavement grade. The roadway was widened from 48 feet to 60 feet and the existing granite curbing removed. A four-inch concrete pavement with a 2-inch wearing surface was laid on a 6-inch compacted rock sub-base. New concrete curbing was constructed, brick manholes were raised to grade and the existing catch-basins moved and reconstructed. Contract cost, $39,714; completed December 29, 1942.

---

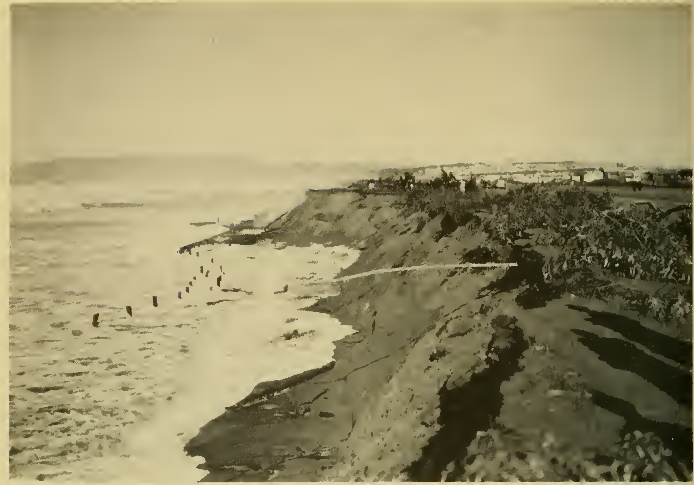
*Second One-Quarter Cent Gasoline Tax

Third Street

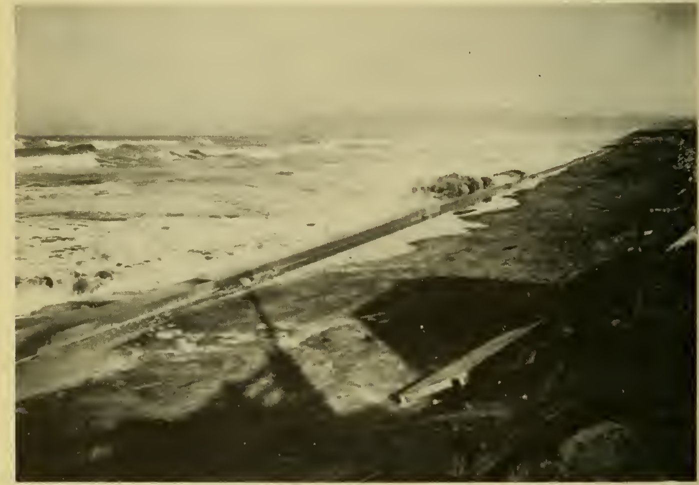
Between Mariposa Street and 23d Street. The roadway has been widened and reconstructed. The cross-section consists of two 38-foot roadways separated by a raised center strip, 4 feet wide, and two 10-foot sidewalks. The roadways are paved with 8 inches of hydraulic concrete and 2 inches of asphaltic concrete wearing surface. Alterations were made to high and low pressure fire hydrants, pipes, and appurtenances, drainage system, and provision was made for traffic control. Contract cost, $123,190; completed February 10, 1942.



Third Street
North from 22d Street



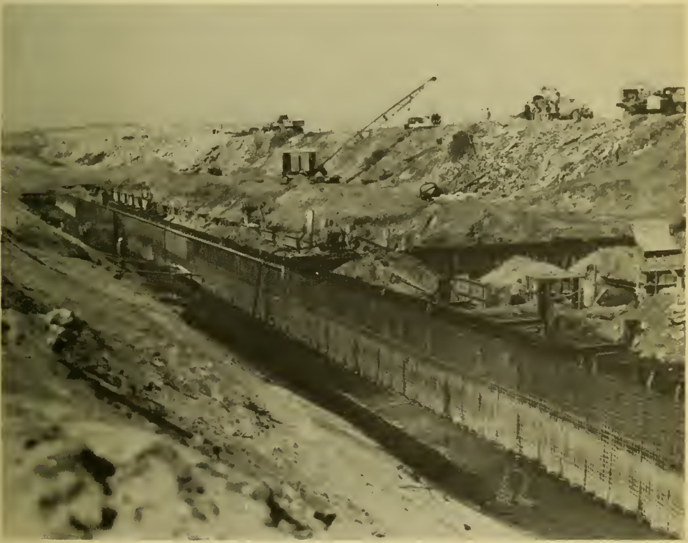
Great Highway at Taraval Street
Showing damage to old wooden bulkhead



New sea wall at Taraval Street
Looking north during a storm

Great Highway Protection

To prevent further encroachment of the ocean on the Great Highway near Taraval Street, a bulkhead has been built. The work consisted of constructing a bulkhead 662 feet long, a stairway, restoring embankments, repairing the pavement and gutter along the Great Highway, and other incidental work. Interlocking steel piles 26½ feet long were driven to elevation -26.67 feet below the City base; 50 anchor piles 22 feet long were driven to line and grade 20 feet behind the sea wall, at 16-foot centers; 50 steel struts were placed between the anchor piles and the back of the wall. A reinforced concrete cap was constructed on the sheet piling. To each anchor pile a concrete slab was added. West of the west gutter a 20-foot berm with two to one slope was built to the loose rock fill at the toe of the slope. The existing apron in



Showing sheet piling for sea wall

front of the Taraval Street underpass was removed and reconstructed with a basalt block pavement laid on a 12-inch red rock sub-base with a 4-inch sand filler. The damaged portion of the concrete gutter along the Great Highway was rebuilt. The missing and damaged portion of the pavement on the Great Highway was rebuilt with a 10-inch red rock base and 2 inches of asphaltic wearing surface. A massive concrete stairway leading from the Beach to the top of the bulkhead was constructed on four steel H piles. A heavy 2-inch wrought iron rail was furnished and installed on the top of the concrete cap and stairway opposite the Taraval Street underpass. Gunite was applied to the westerly face of the the steel sheet piling in the main, north and south bulkheads between the bottom of the concrete cap and elevation -10 City base. Contract cost, $66,455; completed December 10, 1941.

Taraval Street sea wall
Looking south

Great Highway Protection Contract #2

The beach area between the bulkhead and the toe of the slope was paved with mortared flagstones, and basalt block stairways were constructed on each side of the Taraval Street underpass leading from the Beach to the Great Highway. Contract cost, $4,185; completed May 12, 1942.

Pavement Planing

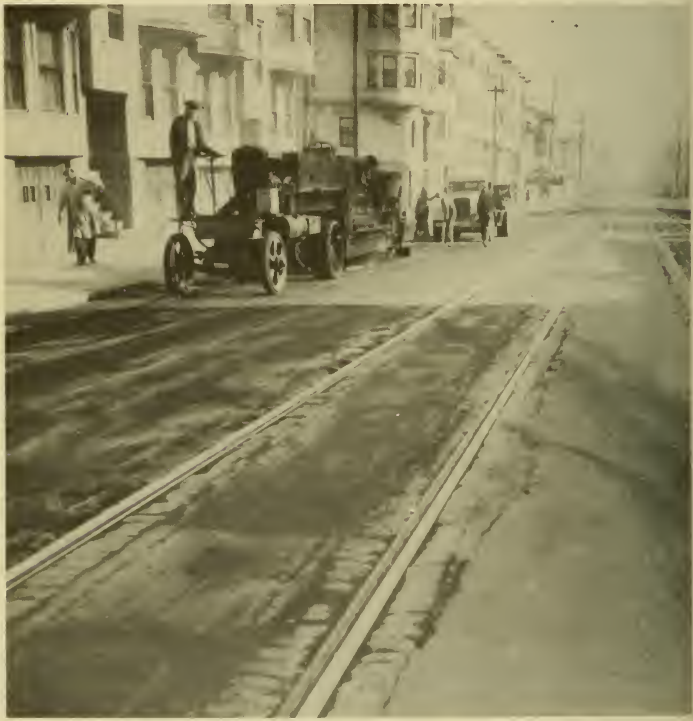
The program for planing pavement surfaces was carried on throughout the year. The following streets, boulevards, and highways were planed under contract at a total cost of $25,183 for the fiscal year ending June 30, 1942:

Army Street, Bay Shore Boulevard to Third Street
Fell Street, Franklin Street to Stanyan Street
Lincoln Way, Third Avenue to Great Highway
Masonic Avenue, Geary Street to Turk Street
Pine Street, Gough Street to Scott Street
Van Ness Avenue, Jackson Street to Bay Street
Francisco Street, Van Ness Avenue to Laguna Street
Bay Street, Van Ness Avenue to Leavenworth Street
Chestnut Street, Van Ness Avenue to Fillmore Street
Filbert Street, Van Ness Avenue to Pine Street
Franklin Street, Vallejo Street to Bay Street
Green Street, Van Ness Avenue to Octavia Street
Pine Street, Scott Street to Presidio Avenue
Bush Street, Lyon Street to Van Ness Avenue
Lake Street, Arguello Boulevard to Twenty-eighth Avenue
Broderick Street, Sutter Street to Bush Street

The following streets, boulevards, and highways were planed under contract at a total cost of $88,408 for the fiscal year ending June 30, 1943:

Pine Street, Leavenworth Street to Jones Street
Pine Street, Taylor Street to Mason Street
Leavenworth Street, McAllister Street to O'Farrell Street
Hyde Street, Golden Gate Avenue to Post Street
Eddy Street, Laguna Street to Jones Street
Clay Street, Arguello Boulevard to Pierce Street
Anza Street, Funston Avenue to Thirtieth Avenue
Irving Street, Ninth Avenue to Thirty-first Avenue
Van Ness Avenue, Jackson Street southerly
Anza Street, Funston Avenue to Arguello Boulevard
Fulton Street, Franklin Street to Stanyan Street
Howard Street, Seventh Street to Ninth Street
Irving Street, Thirty-first Avenue to Great Highway
Kirkham Street, Nineteenth Avenue to Great Highway
Laguna Honda Boulevard, Portola Drive to Dewey Boulevard

Market Street, Corbett Avenue to Castro Street
Oak Street, Van Ness Avenue to Stanyan Street
Portola Drive, St. Francis Circle to Corbett Avenue
Santiago Street, Nineteenth Avenue to Thirty-sixth Avenue
Sloat Boulevard, Nineteenth Avenue to St. Francis Circle
Van Ness Avenue South, Eighteenth St. to Twenty-sixth St.
Vicente Street, West Portola Ave. to Nineteenth Avenue
Seventeenth Avenue, Kirkham Street to Vicente Street
Thirty-fourth Avenue, Quintara Street to Taraval Street
Santiago Street, Fourteenth Avenue to Nineteenth Avenue
Claremont Boulevard, Dewey Boulevard to Portola Drive
Geary Boulevard, Presidio Avenue to Twenty-fifth Avenue
Great Highway, Lincoln Way to Point Lobos Avenue
Marina Boulevard, Baker Street to Laguna Street
Market Street, Valencia Street to Castro Street
Monterey Boulevard, Acadia Street to Gennessee Street
Scott Street, Jackson Street to Green Street



Heater Planer at work

BOULEVARDS BY JOINT HIGHWAY DISTRICTS

District #9
Ocean Shore
Boulevard

Contractor Fred Fredenbury of South San Francisco completed an arch culvert, and N. M. Ball Sons of Berkeley completed their grading and paving contract at Montara Creek, August 29, 1941. Total cost of construction, $13,677.

Harms Brothers of Sacramento were awarded a contract for grading and paving a 2.6 mile section of the Ocean Shore Highway from two miles south of Tunitas to one mile south of Lobitas. Bid price was $255,768. Work was started August 5, 1942, and is expected to be finished the latter part of 1943.

The Granite Construction Company of Watsonville completed the construction of three bridges at Little Baldwin, Wilder, and Coja Creeks November 18, 1942. Total construction cost was $126,256.

The California Paving Company of San Mateo started a grading and paving contract at Finney Creek on May 4, 1943, estimated to cost $25,000 and to be completed in about six months.

District #10
Junipero Serra
Boulevard
Extension

WPA forces working on Contract No. 4 - Cypress Lawn to Sneath Lane - were forced to stop work on June 16, 1941, on account of lack of funds; and a new WPA contract was started July 15, 1941, constructing center island curbs and paving roadways. Crushed rock for the pavement base was obtained from the Rockaway Beach Quarry. Considerable delay in paving operations was caused by time required to remove material from the roadway deposited by slides which occurred during the previous winter. WPA quit the contract December 31, 1941, on account of labor shortage.

The California Paving Company of San Mateo started their contract September 11, 1942, for laying an armor coat pavement from Cypress Lawn to Sneath Lane, a distance of 2.9 miles. The work was completed January 15, 1943. Cost of contract, $36,356.

Leonard-Coates Company of San Jose furnished the plants, shrubs, and trees for the planting of the 26-foot center strip or medial divider. Planting was started November 2, 1942. The center strip was also planted with mesembryanthemum florabundum (ice plant).

Treatment of the one to one cut slopes to prevent further erosion was started March 12, 1943. The slopes were covered with loam and seeded with rye grass, yellow and blue lupin, and California poppy.

MISCELLANEOUS STREET CONSTRUCTION

IMPROVED UNDER PUBLIC CONTRACT WITH CITY FUNDS

Union Square

In widening and reconstructing the streets adjoining Union Square, the existing sidewalk and granite stone curbing were removed, a new sidewalk and curb were constructed within Union Square by the Union Square Garage Corporation, and the existing roadway on the streets adjoining the Square was widened to the property line to provide for a 10-foot concrete pavement service lane. Four pedestrian safety islands were constructed. Drainage work included the installation of catch-basins and storm water inlets. Cast iron gutter gratings were installed at all entrances to the garage. Contract cost, $18,752; completed October 5, 1942.

IMPROVED UNDER PUBLIC CONTRACT BY ASSESSMENT DISTRICT

Visitacion Avenue

Visitacion Avenue, between Hahn and Schwerin Streets, was improved by excavating to the official grade, and by the construction of 2-inch asphaltic wearing surface on a 6-inch concrete base, concrete sidewalk and curbing, side sewers, catch basins, and manholes. The total contract amounted to $25,282 of which the City contributed $14,503 out of special gas tax street improvement funds, assessing the balance to the property owners. The contract was completed January 12, 1943.

Sunnydale Avenue

Sunnydale Avenue between Hahn and Schwerin Streets was improved by grading to the official line and grade, and by the construction of an asphaltic concrete pavement on a rock sub-base, consisting of a 6-inch compacted rock sub-base, a 4-inch asphaltic concrete base, and a 2-inch asphaltic concrete wearing surface, unarmored concrete curb; 10-inch vitrified clay pipe culverts; 6-inch side sewers; new brick catch basins complete. Existing brick catch basins were reset. The work was done under public assessment at a cost of $20,343 of which the City contributed $8985, and was completed May 29, 1942.

Twenty-fourth Avenue

Twenty-fourth Avenue, between Ortega and Quintara Streets, was improved by bringing it up to the official line and grade. Construction included: 6-inch asphaltic concrete pavement on rock sub-base, unarmored concrete curbs, 8-inch vitrified clay pipe sewer, side sewers, manholes, and catch basins. Total contract cost amounted to $21,606. The City contributed $10,331 out of the County Road Fund, the balance being assessed to the property owners. Contract was completed January 16, 1942.

Quintara Avenue

Quintara Avenue, between Twenty-fourth and Twenty-sixth Avenues, was improved by grading and by the construction of asphaltic concrete pavement, concrete curbing and sewers. The work was done by public assessment at a total cost of $18,349 of which the City contributed $11,716, and was completed December 7, 1942.

Miguel Street

Beacon and Miguel Streets from Harry Street easterly was improved by grading and by the construction of pavement, curbing, retaining walls, and concrete stairs. Total contract cost amounted to $22,411. The City contributed $12,084 out of the County Road Fund, and the balance was assessed to the property owners. The work was completed October 29, 1942.

IMPROVED UNDER PRIVATE CONTRACT

During the fiscal year of 1941-1942 work was done on the following subdivisions: Crescent Terrace, Sunnydale Manor Tract, Junior Terrace, Lakeshore Park Subdivision No. 2, Raycliff Terrace, Sunnydale Low Rent, and Stonecrest Subdivision.

Other private contracts were:

Aztec Street, Shotwell Street to Winfield Street
Brookdale Avenue, Geneva Ave. to U.S. Housing Project
Blackstone Court, Franklin Street to westerly termination
Bancroft Avenue, Third Street to 500 feet northwesterly
Cayuga Avenue, Modoc Avenue to Naglee Avenue
Cuvier Street, Bosworth Street to Cayuga Avenue
Coso Avenue, Winfield Street to Elsie Street
Connecticut Street, 616' south of 20th St. to 696' south
Duncan Street, Diamond Street, 350 feet easterly
Dorcas Way, Bella Vista Way to Foerster Street
Forty-sixth Avenue, Lawton Street to Moraga Street
Foerster Street, Dorcas Way to Kenyon Avenue
Grand View Avenue, Market Street to Grand View Terrace
Melrose Avenue, Detroit Street to easterly termination

Mission Street, Murray Street to Mission Viaduct
Newburg Street, 27th Street to Duncan Street
Naglee Avenue, Cayuga Avenue to S.P.R.R. right of way
Norwich Street, Alabama Street to 100 feet west of Harrison Street
Oxford Street, Silliman Street to 50 feet southerly
Pacheco Street, 23d Avenue to 24th Avenue
Prague Street, South Hill Boulevard to Geneva Avenue
Quesada Avenue, Silver Avenue to Quint Street
Quintara Street, 45th Avenue to 46th Avenue
Santos Street, Geneva Avenue to 275 ft. northerly
Stillings Street, Detroit Street to 526 ft. easterly
Silliman Street, Oxford Street to 95 feet westerly
Talbert Street, Sunnydale Avenue to County line
Thomas Avenue, Silver Avenue to Selby Street
Trumbull Street (through Stonecrest)
31st Avenue, 32d Avenue, 33d Avenue and 34th Avenue - from Ortega Street to Pacheco Street
26th Street, Vermont Street to Kansas Street
26th Street, Kansas Street to Rhode Island Street
35th Avenue, Ortega Street to Pacheco Street
32d Avenue, Pacheco Street to Quintara Street
Thornton Avenue, Venus Street to Topeka Street

During the fiscal year of 1942-1943 work was done on the following subdivisions: Miraloma Park, McLaren Park Terrace, and Silver Terrace under private contracts.

Other private contracts were:

Bridgeview Drive, Newhall St. to S.P.R.R. right of way
Carolina Street, 15th Street to 16th Street
Dunsmuir Street, Silver Avenue to 300 feet northerly
Egbert Avenue, Newhall Street to 545 feet westerly
Moraga Street, 37th Avenue to 38th Avenue
Newhall Street, Bay View Street to Topeka Street
Newhall Street, Egbert Avenue to S.P.R.R. right of way
Pacheco Street, 30th Avenue to 33d Avenue
31st Avenue, Noriega Street to Ortega Street
Ulloa Street, 41st Avenue to 42nd Avenue

AIR RAID SIRENS

At various locations throughout the City five wooden towers were constructed and air raid sirens installed thereon. Contract cost was $5,920; completed June 19, 1943.

TRAFFIC

During the fiscal year ending June 30, 1942, the Traffic Engineering Section continued the work of directing and supervising traffic striping, installing and maintaining traffic signs and traffic control devices. Complaints and suggestions from public and civic organizations were fully investigated. As funds became available many improvements were made.

A contract was awarded for the furnishing and installation of a traffic signal system, traffic islands, center islands, safety lighting, signs, and beacons on 19th Avenue and Park-Presidio Boulevard, State Highway Route No. 56. Bid price was $75,000.

Signals and standards were purchased at a cost of $11,446 for installation on Lombard Street and Richardson Avenue from Van Ness Avenue to Lyon Street (a part of State Highway Route No. 2). This work will be completed after the war.

At the intersection of Market Street and Clayton Street, the existing safety island was removed and a new island constructed, together with safety lighting, paving, and drainage. At the intersection of Market Street and Eagle Street, the work included the furnishing and installing of vehicular and pedestrian signals with control equipment, warning lights, and traffic safety lights. Contract cost for this work was $7,656.

Plans and specifications were prepared for the re-routing of vehicular traffic with adequate directional and warning signs, during street construction, for the following projects:

6th Street bridge - repairs
Lincoln Way - storm relief sewer
15th Street and Church Street - sewer system
Laguna Street - diversion sewer
Bernal Avenue - eastside crib wall
Intersection of Alemany Blvd. and Ocean Avenue - channelization

Alemany Boulevard - Section A
3d Street - 23d Street to Custer Street
Army Street - Harrison Street to Van Ness Avenue, South

After the widening of 3d Street, traffic signals were installed at the intersection of 3d Street and 20th Street.

The regular maintenance program of traffic striping and pedestrian lane markings was continued: 217 miles of lane stripes, crosswalks at 1,377 intersections, and 6,000 words were painted on the pavement, the words "School Slow" were painted at 531 intersections in the vicinity of schools throughout the city, using a total of 8,500 gallons of white traffic lacquer. The cost, including labor and materials, was $51,000.

During the year 260 new street signs were installed, and 237 repaired. In cooperation with the Police Department, 90 standard reflector "Stop" signs, 160, warning, regulatory, and guide signs of plain and reflector type, and 314 parking restriction signs were installed.

Guard rails were installed at four intersections where this form of protection was considered necessary for traffic safety.

Traffic counts were made at 15 intersections, and traffic and safety conditions investigated at 32 locations. Many of the locations were improved by the installation of regulatory signs or traffic striping.

A survey was made of the parking conditions in the vicinity of the Union Iron Works regarding the possibility of angle parking. On some of the streets, stalls were painted and angle parking permitted, providing space for additional vehicles.

Angle parking stalls were painted on the center of Fillmore Street from Chestnut Street to Marina Boulevard in the area formerly used by street cars. Thus space was provided for 125 vehicles without interfering with the movement of traffic.

TRAFFIC - Fiscal Year Ending June 30, 1943

The regular maintenance program of traffic striping, including school pedestrian lanes and pavement "School Slow" signs, was continued throughout the year. Standard traffic lacquer was not obtainable and it was necessary to substitute a formula utilizing available materials. The substitute lacquer was not entirely satisfactory, being particularly deficient in wearing qualities, and repainting was necessarily more frequent. To conserve lacquer, traffic lane stripes were dash-painted instead of being made continuous.

A total of 224 miles of lane stripes, crosswalks at 1540 intersections, and 5000 words were painted on the pavement, using 6,250 gallons of white traffic lacquer. The expenditure for labor and material was $43,000. Included were school pedestrian lanes and"School Slow" pavement signs at 566 intersections, "Dimout"signs at 86 intersections on the east boundary of the dimout area, and 3-foot diameter police stars along Market Street to designate stops for street cars during a blackout.

Materials used heretofore for standard street sign installations were not available and satisfactory substitutes were not found. A few signs of all-wood construction were installed. In appearance and in strength, these signs are greatly inferior to the standard all-metal sign, and maintenance costs are higher.

Traffic signs of all types were manufactured from 3/16" fiber panels and mounted on redwood posts, the use of steel being restricted by WPB regulations.

There were installed: 59 reflector type "Stop" signs, 493 warning and regulatory signs, and 604 parking restriction signs. Many of these signs were placed on streets in the downtown area where one-way traffic and parking regulations have been put into effect.

Large reflectorized signs reading "City of San Francisco" were installed at the County Line on the three main routes leading into the City from the south. These installations were made in response to many complaints that motorists entering the City for the first time were unaware of their arrival in San Francisco until they had reached the downtown area.

Three and one-half tons of old steel pipe were contributed to the scrap metal drive as a result of relocating 250 existing traffic signs on adjacent light and trolley poles.

Traffic signals were installed at the intersection of 9th and Folsom Streets to facilitate the increased flow of vehicular traffic. At The Embarcadero and Market Street traffic signals were relocated after the existing pedestrian viaduct was removed. At the intersection of Dolores and Randall Streets, the signal at the northwest corner was relocated to give better visibility to south-bound motorists.

With the advent of gasoline rationing, many requests were made to close down or change the timing of traffic signals at numerous intersections throughout the City. After an investigation, a report was made recommending the closing down of signals at five intersections, a change in timing at one intersection, and a reduction in the number of operating hours at fifteen intersections.

Dimout regulations required that traffic signal lenses be shielded and, at the request of the Traffic Advisory Board, appropriate black metal shields were manufactured and fitted to the signals at 22 intersections on important traffic routes.

At Bayshore Boulevard and Leland Avenue, on State Highway Route #68, traffic islands were constructed and safety lighting and regulatory signs installed. Contract cost, $2,475.

Plans, specifications, and sequence schedules were prepared for the re-routing and control of vehicular traffic during construction operations on the following street and sewer projects:

Market Street, Castro Street to Valencia Street
Third Street Bridge at Channel Street, new timber deck
Fourth Street Bridge, new north fender
Sansome Street and Union Street, slope stabilization
Jackson Street sewer, Sansome Street to Battery Street
Ashbury Street sewer, Waller Street to Frederick Street
Marin Street, sewer outlet
Lower Islais Creek sewer, Section X outlet
Fell Street sewer replacement, Webster St. to Laguna St.
Ingleside Terrace sewer system, Borica St. to Lyndhurst Drive

Traffic and safety conditions were investigated at 28 locations throughout the City, and improvements were made by traffic striping or by the installation of regulatory signs.

In cooperation with the Division of Highways, origin, destination, and volume counts were made at eight intersections on State Highway routes within the City.

Metal safety zone buttons were removed from all streets (with the exception of Geary Boulevard, Market Street, and Potrero Avenue), and were replaced on many streets by asphaltic or concrete bars painted white. These bars require frequent re-painting, also many are broken by the impact of heavy vehicles, thus keeping the maintenance cost high.

BRIDGES

Third St. Bridge
Over Channel St.
Waterway

The existing deckwork on the roadway and walks was removed. A new timber deck with a bituminous wearing surface was installed. The top flange of the existing steel stringers, floor beams, rail chairs and other steelwork exposed by the removal of the deck were cleaned and painted. The lift span and counter weights were kept in balance at all times during reconstruction. Contract cost, $28,267; completed June 19, 1943.

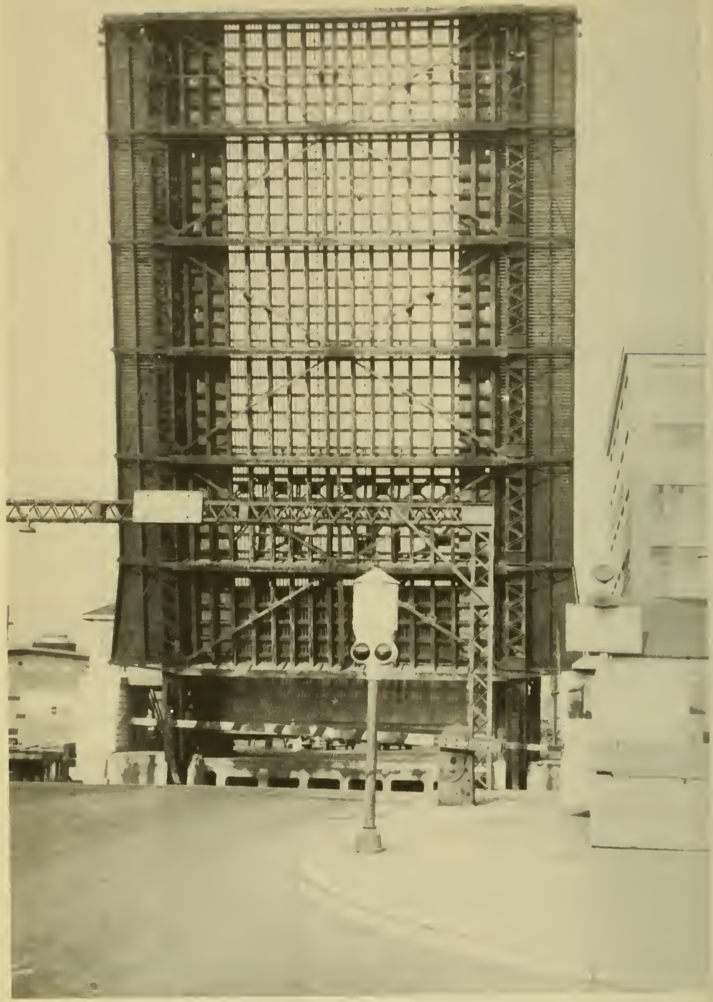
Sixth Street
Bridge

Over Channel Street Waterway. The old wooden deck, including the top floor, sub-floor, stringers, railing pieces and blocking were removed and replaced with new timber construction. The existing wheel guards, guard rails, and traffic plates were re-installed. All structural steel, tie rods of the swing span, and tops of steel floor beams and deck structure exposed by the removal of wooden deck were cleaned and painted. Contract cost, $9,893; completed January 8, 1943.

Fourth Street
Bridge

On April 13, 1943, the bridge operator, while raising the Fourth Street bascule bridge over Channel Street waterway to allow a ship to navigate past, noticed unsteady movements and sharp vibrations of the leaf as it was nearing the end of its raised position. After the leaf was fully raised, the operator checked the drive mechanisms and found that the main drive pinion and rack, on the west side, were out of mesh because of a broken bearing casting. All vehicular traffic was immediately stopped and re-routed. Heavy timber supports were placed to lock the raised leaf and allow shipping to use the water-way while repairs were being made.

Emergency work was immediately started, and included the



Fourth Street Bridge
Showing new steel open deck grating

following. The pinion shaft and pinions, two bearings and driving gears were removed for necessary machine and shop labor. The broken portion of the bearing which was riveted to the structural members was removed. New castings were made for the main pinion bearing and the intermediate flange bearing. The bearing liners and cap were salvaged from the broken bearing and were reconditioned and reused. After all bearings were correctly aligned and shimmed, the new intermediate flange bearing was concreted into place. On May 14, 1943, this bridge was again open to traffic.

Contract cost, $3,310.

Fourth St. Bridge
over Channel St.
Waterway

The work included the removal of the bridge floor, pavement, and rails. A new steel open deck grating replaced the old pavement. Concrete curbing was constructed on both sides of the roadway. A portion of the grating adjacent to the curbs was filled with concrete to compensate for the reduction in the weight of the leaf caused by the installation of the steel grating. The lift span and counterweight were kept in balance while the replacement work was in progress. The movable span was reinforced by diagonal bracing. Wooden sidewalks and supports were replaced by new wooden sidewalks and supports. All new steel work and part of the existing steel work were cleaned and painted. Electrical work included dismantling and alteration of the electrical equipment, a new operating bench board, new limit switch, and appurtenances. Contract cost, $27,708; completed August 30, 1943.

SEWERS

Arlington Street Drain

This drain was constructed to intercept the subsurface water on the west side of Bernal Avenue slope. The work done included the construction of a series of vertical drain shafts 4 ft. by 7 ft. at 15-ft. centers. These shafts were interconnected by small tunnels about 4 feet long; an 8-in. perforated drain pipe was placed in the tunnels and across the bottom of the shafts. The open trenches along Arlington Street and the vertical drain shafts were backfilled with crushed rock to a point 8 feet below the curb. Tunnels between the vertical shafts were completely backfilled with crushed rock. An 8-inch diameter vitrified drain pipe was built across both Arlington Street and the west slope of Bernal Avenue to an existing sewer. Construction cost was $16,981; completed April 12, 1943.

Burnham and 24th Streets

A drainage system has been built to stop a slide movement on Burnham Street between Twenty-fourth and Elizabeth Streets and to intercept the subsurface water flowing from the hillside above Market Street. Vertical drainage shafts 4 ft. by 7 ft. at 15-ft. centers and varying depths, from 12 feet to 29 feet, were constructed along Burnham and Twenty-fourth Streets. The shafts were connected by small tunnels about 4 feet long, and an 8-in. perforated drain pipe was placed in the tunnels and through the shafts. All shafts were backfilled with crushed rock to within 6 feet of the existing ground surface. Contract cost was $18,485; completed June 30, 1943.

Jerrold Avenue

From Napoleon Street to Selby Street. A 12-inch vitrified clay pipe sewer was constructed, together with the necessary side sewers and manholes. The contract cost was $7,576; completed August 1, 1942.

Jackson St. Sewer

Between Battery and Sansome Streets. A section of the main trunk sewer was replaced by the construction of a new 5-foot diameter 3-ring common brick sewer built on a plain class "D" concrete cradle. A 12-inch vitrified clay pipe sub-drain imbedded in crushed rock was laid under the sewer. Cast iron and cast steel fittings for the manholes were furnished the contractor from the City's maintenance yard. This sewer replaces an old 4-foot by 6-foot brick sewer built in 1870. Incidentally, this is the first all-brick sewer constructed in San Francisco in 43 years.

Two 10-inch water pipes (one high and one low pressure), were removed and relaid in a new location. All pavement, sidewalks and curbs which were removed during construction of sewer were replaced. Contract cost, $39,679; completed June 30, 1943.

Jackson Street Sewer
Between Battery and Sansome Streets
During construction

St. Mary's Playground

An underground drainage system has been completed within the playground to prevent earth slides. The work included the boring of approximately 160 - 30-inch diameter, vertical shafts on 5-foot centers, varying from 15 feet to 33 feet in depth. Tunnels were built between the drain shafts, and a 6-inch diameter perforated metal pipe drain was laid in the tunnels and through the bottom of the shafts. Crushed rock was used to completely backfill the tunnels, drain shafts up to the water table, and the open trenches up to a depth of 3½ feet above the drain pipe. Two 30-inch diameter steel casing manholes were constructed with frames; covers were set over the tops of the manholes. The purpose of these manholes is to check the water table and the flow of water at regular intervals. Contract cost, $12,234; completed December 17, 1942.

Market & Glendale Intercepting Drains

To retard the movement of a slide near Glendale and Market Streets, an intercepting drainage system has been built in the slide area. The work included a 6-inch perforated vitrified clay pipe drain, imbedded in concrete, covered with 2 feet of crushed rock, and laid between two drainage pits. Two 6-inch perforated lateral drains were placed east and west of pit #2. An 8-inch vitrified clay drainage pipe, together with the necessary manholes, was constructed across Market Street and along Yukon Street to connect with the existing sewer at Short Street. Contract cost, $5,126; completed January 13, 1943.

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

Operation and maintenance of the Richmond-Sunset Sewage Treatment Plant continued in a satisfactory manner throughout the fiscal year ending June 30, 1942, the third full year during which the plant was in operation.

The sewage flows treated were 1,704.7 million gallons by gravity from the Richmond District, and 1,325.2 million gallons pumped from the Sunset District, or a total of 3,029.9 million gallons. Storm water was by-passed for a period equivalent to 57.9 days for the Sunset District, and 0.97 days for the Richmond District. The average daily flow for the year was 8.3 million gallons compared to 7.4 million gallons in the preceding year, an increase of 12 per cent. Average wet and dry weather flows were 10.8 and 8.3 million gallons respectively. A total of 11,585 cubic feet of screenings, 2,604 cubic yards of grit, and 2,851 tons of dry sewage solids were removed and 4,139 tons of filter cake, amounting to 1,003 tons of dry solids produced. Digested sludge delivered to city parks for use as fertilizer amounted to 5,486 cubic yards of filter cake, estimated to have a value of $20,000.

Department of Public Health bacteriological examinations for coliform organisms in the shore waters along the Great Highway, China and Baker's Beaches indicated continued satisfactory conditions.

Pre-Treatment

The bar racks operated continuously with approximate removals of 3.8 cubic feet of screenings per million gallons of sewage. All electrical wiring inside both racks was replaced with rubber insulated cable sealed with packed glands to eliminate deterioration resulting from high humidities. With completion of the brick trash incinerator utilizing waste digester gas, it was found possible to successfully dispose of screenings in this incinerator with a minimum of nuisance. All screenings were thereafter incinerated. This eliminated difficulties previously experienced with wear of screenings grinder shredder teeth and clogging of sludge pump impellers with shredded material.

The grit grease tanks also operated continuously with grease removals averaging approximately 900 gallons of solution daily. As in previous years, however, grit removal was not complete, some very fine sand being carried over to the mixing and sedimentation tanks because of excessive flowing through velocities. Some relief can be expected when the other two grit grease tanks are equipped and put into service, as originally planned. The sand pump wearing rings and impeller were renewed.

Sludge Control and Sedimentation

Mechanical equipment in the flocculation and sedimentation tanks functioned satisfactorily, requiring only normal adjustment and maintenance.

The flocculation tanks were drained and sand removed twice during the year. The wooden floats used for measuring the volume of sludge pumped from the thickening tanks to the digester were replaced with new brass floats and gauge rods, resulting in more precise volume measurements. The redesigned sludge and sand pump wearing rings mentioned in last year's report are superior in wearing properties and give better pump performance. They are inexpensive and easy to replace.

For the year the average raw sewage suspended solids were 255 p.p.m.* and plant effluent 76 p.p.m., removal 70 per cent; the corresponding 5-day biochemical oxygen demands were 235 and 120 p.p.m., removal 51 per cent.

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*parts per million

Chlorination

Odors were maintained at a minimum with continuous pre-chlorination at a rate of 30 pounds per million gallons of sewage. Post-chlorination was used except during storms from March through November at a rate averaging from 60 to 120 pounds per million gallons of sewage during the first half of the year, and 80 to 100 pounds for the balance of the year to maintain an average residual of 0.5 p.p.m. after a contact period of 5 minutes. The chlorine diffusers in the effluent channel were relocated approximately 20 feet south of the Bowlus-Palmer flume to insure adequate chlorination at the elutriation wash water overflow weir.

Sludge Digestion

As in previous years satisfactory stratification in the digester could not be obtained because of insufficient digester capacity. The design capacity is approximately one cubic foot per capita with temperatures ranging from 86° to 90° F. Gas generation varied with the rate of sludge addition, the metered production averaging about 0.7 cubic feet per capita of connected population, not accounting for gas leakage through the digester seals.

A leak in the hot water return pipe inside the digester from the west bank of heating coils was corrected by blanking off this section and connecting a rubber hose for hot water service from the end of the heat exchanger header to the return line outside the digester.

A diaphragm operated liquid level gauge was installed for determining the height of liquid in the digester.

Elutriation and sludge filtration

All sludge withdrawn from the digester was washed in the elutriation tanks, with an alkalinity reduction of about 80% to an average of 470 p.p.m. Carry-over of elutriated sludge with tank overflow decreased somewhat with better control of sludge withdrawals from the digester.

The sludge venturi meter was cleaned, adjusted and recalibrated during the winter season.

Sludge dewatering continued regularly throughout the year. An average dose of 4.2 per cent ferric chloride by weight was required to properly condition the sludge with a filter yield of approximately 5.4 pounds dry solids per square foot filter area per hour. Average filter cloth life continued at approximately 1000 hours.

The suction line of the pump for elevating concentrated ferric chloride solution to the daily make-up tanks was located at one end and at the bottom of the main storage tank. Failure of this line would result in loss of tank contents and flooding of the basement floor with concentrated ferric chloride. Consequently, a hard rubber siphon leg running over the top of the storage tank was installed eliminating the bottom suction line.

A material improvement in the operation of the vacuum filter resulted from the removal of incrustations on the filter screen with inhibited hydrochloric acid, and the construction of drainage pans under the horizontal conveyor.

Sunset Pumping Station

The plant operated continuously except for the usual by-passing during storms, and once during the year for sand removal and repairs to equipment. The schedule of periodic pumping down and flushing of the sump was continued. The sand and sewage pumps required normal maintenance and adjustment.

Laboratory

For the year the laboratory made about 7,500 routine and special analyses necessary for providing a continuous record of plant performance. Daily analyses included suspended solids on 24-hour composites of raw sewage and plant effluent; raw sludge moisture content and volatile solids; digested and elutriated sludge moistures, volatiles and pH; digester gas density; and strength of ferric chloride solutions used for vacuum filtration.

Five-day biochemical oxygen demands on 24-hour composites of raw sewage and plant effluent were determined twice weekly. Shipments of concentrated ferric chloride solutions were assayed for strength as a basis for payment. Composite samples of filter cake were analyzed monthly for fertilizer constituents and chlorine residuals on chlorinated effluents determined periodically.

Miscellaneous Maintenance and Improvements

The program of exterior metal window frame and interior machinery painting instituted last year was continued in the Pre-Treatment and Administration Buildings. Improvements in the Administration Building consisted of construction of shelving in the basement storeroom, the installation of a liquid level indicator for recording depths of flow in the Mile Rock sewer, and the addition of an auxiliary air receiver to furnish a reserve supply of compressed air adequate for lifting the movable gate in the Mile Rock sewer. A contract for cleaning and galvanizing all metal floor gratings throughout the plant was completed during the year. Another worth while improvement was the construction of the brick trash incinerator, utilizing waste digester gas. With some modification, it was found possible to use this incinerator for screenings disposal, as previously mentioned.

Summaries of main plant operating data for the fiscal year are given in Tables 1-4.

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

COST OF OPERATION

1941-1942

Item of Expenditure	Total Plant Operation	Sewage Treatment with Chlorination	Sunset Pumping Plant	Sludge Disposal Conditioning & Filtration	Sewage Treatment without Chlorination
Permanent Salaries	$36,228	$22,663	$5,753	$7,812	$18,275
Temporary Salaries	1,565	909	281	375	713
Wages	8,072	4,023	1,002	3,047	3,733
Contractual Services	5,001	3,746	555	700	3,510
Heat, Light & Power	9,276	4,317	4,372	587	4,317
Plant Chemicals	10,230	7,570	0	2,660	0
Materials & Supplies	4,805	3,584	261	960	3,426
Equipment	113	113			113
Total	$75,290	$46,925	$12,224	$16,141	$34,087
Cost operation per M.G.	$24.85	$15.49	$4.03	$5.33	$11.25

Richmond Flow -	1,705	M.G.
Sunset "	1,325	M.G.
Total	3,030	

Estimated cost per capita $0.50 per yr.

4,140 tons fertilizer, estimated value $20,700 delivered to City Parks during above period.

Additional Expenditures

Plant Improvements	$1,926
Painting	1,256
Office Engineering	5,750
	$8,932

The Sunset Pumping Plant and the Vacuum Filter were not operated at all scheduled times. The Sunset flow must be by-passed during storms to prevent back-up in the storm sewers, and to avoid large quantities of sand being brought to the sump. This results in decreased plant flow and less sludge to the digester and to the vacuum filter.

TABLE 1 - FLOW AND PRE-TREATMENT DATA

Month	Flow M.G.			Days By-Passed		Rain	Screen-ings	* Grease Gallons	Sand Cu Yd		Chlorination Lbs		Sewage Temp °F
	Richmond	Sunset	Total	Rich-mond	Sun-set	Inches	Cu Ft	Pumped	Pre-Treat	Sun-set	Pre	Post	
July 1941	129.3	119.5	248.8			.01	930	27900	102	35	7750	19900	68
Aug.	138.0	122.4	260.4		.08	.05	815	27900	94	39	8400	19140	68
Sept.	130.3	122.1	252.4				775	27000	92	46	7570	20760	70
Oct.	113.9	104.4	218.3	5.62	5.62	.83	685	23400	93	33	6550	17900	70
Nov.	152.6	91.2	243.8	.42	8.65	2.49	890	27000	157	154	7300	14690	68
Dec.	190.2	54.5	244.7	.34	19.03	7.18	965	23600	195	120	4960	-	65
Jan. 1942	190.7	93.8	284.5		11.12	4.08	1030	24300	201	131	5100	-	60
Feb.	140.6a	91.4	232.0	1.93	10.92	4.35	830	22300	143	109	3900	350	58
Mar.	84.1a	139.6	223.7		2.39	2.80	1030	27900	63	77	4330	5870	60
Apr.	155.1	115.8	270.9		7.55	5.03	1085	23400	144	118	8130	17020	61
May	141.0	138.3	279.3		1.22	1.18	1285	27900	154	130	8380	21150	64
June	138.9	132.2	271.1				1265	27000	97	77	8120	22350	66
	1704.7	1325.2	3029.9	8.31	66.58	28.00	11585	309600	1535	1069	80490	159130	65

(a) Gate at 24th and Lake closed from February 23d to March 21st to repair Richmond Sewer Tunnel.
* Approximate removals from grit-grease tanks; does not include additional removals in Mixing and Sedimentation Building.

By-Passing - Richmond: 0.97 days, rain; 7.34 days, sand removal, repairs, etc.
Sunset: 57.81 days, rain; 8.77 days, sand removal, repairs, etc.

Pre-Chlorination: 30 lbs. per MG continuously throughout year.

Post-Chlorination:

July - Nov. 1941
2 A.M. - 8 A.M. 60 lbs. per MG
2 A.M. -10 A.M. 80 lbs. per MG
10 A.M. - 1 P.M. 120 lbs. per MG
1 P.M. - 3 P.M. 100 lbs. per MG
3 P.M. - 5 P.M. 80 lbs. per MG
5 P.M. - 2 A.M. 100 lbs. per MG

Dec. 1941 - June 1942
9 A.M. - 6 P.M. 100 lbs. per MG
6 P.M. - 9 A.M. 80 lbs. per MG

No post-chlorination during winter season nor when Sunset flow by-passed.

TABLE 2 - SLUDGE TO DIGESTER AND GAS PRODUCTION

	Raw Sludge to Digester					Gas Production Cu Ft			Digester
Month	Gallons	% Water	Lbs Dry Solids	% Volatile	Lbs Volatile	To Boilers	To Waste	(a)Total	Temp oF
July 1941	1,847,000	95.93	633,000	83.4	527,900	1,266,000	2,423,000	3,689,000	89
Aug.	1,786,800	95.57	664,800	83.2	553,100	1,259,000	2,623,000	3,882,000	90
Sept.	1,738,900	95.55	651,000	83.2	541,400	1,243,000	2,505,000	3,748,000	89
Oct.	1,540,200	96.40	465,500	82.5	384,200	1,666,000	1,737,000	3,403,000	89
Nov.	1,630,900	97.11	396,000	82.5	326,800	1,502,000	1,160,000	2,662,000	89
Dec.	969,800	96.53	282,400	81.6	230,400	1,620,000	785,000	2,405,000	90
Jan. 1942	1,299,900	96.23	411,100	83.8	344,300	1,679,000	992,000	2,671,000	87
Feb.	831,500	96.00	279,700	82.3	229,900	1,453,000	599,000	2,052,000	88
Mar.	1,132,800	96.25	356,800	84.9	303,100	1,786,000	341,000	2,127,000	89
Apr.	1,199,100	96.23	379,700	86.5	328,400	1,621,000	623,000	2,244,000	88
May	1,612,700	96.02	540,300	85.7	463,100	1,377,000	1,052,000	2,429,000	86
June	1,806,900	95.78	640,700	83.9	537,400	*1,500,000	*1,800,000	*3,300,000	86
	17,396,500	96.10	5,701,000	83.8	4,770,000	17,972,000	16,640,000	34,612,000(a)	88

* Estimated

(a) Gas leakage at digester seals not accounted for.

Sludge is withdrawn by gravity approximately ten times per day from the sedimentation into thickening tanks and allowed to settle without mechanism. The supernatant is returned to the mixing tanks and thicker sludge pumped to the digester approximately six times per day.

During the winter months the quantity of sludge removed and its per cent volatile is materially less than during normal operation.

TABLE 3 - DIGESTED SLUDGE TO ELUTRIATION TANKS

Month	Supernatant Gallons	Bottom Gallons	Average % Water	Lbs Dry Solids	Average % Volatile	Lbs Volatile	Solids To Elut. Solids To Dig.
July 1941	1,983,300	159,500	98.68	235,000	65.6	154,300	.37
Aug	2,400,600	268,400	98.78	270,500	65.2	176,300	.41
Sept	1,864,000	341,400	98.65	246,600	64.3	158,800	.38
Oct	1,437,200	77,500	98.40	200,800	66.4	133,300	.43
Nov	1,694,200	168,100	98.48	235,000	64.5	151,400	.59
Dec	937,600	164,000	99.09	83,700	62.3	52,200	.30
Jan 1942	1,111,900	420,300	98.03	240,200	61.5	148,000	.58
Feb	1,234,200	231,900	99.08	112,200	62.0	69,700	.40
Mar	1,692,400	453,200	99.00	178,600	62.6	111,900	.50
Apr	1,431,200	419,500	98.94	163,200	64.8	105,800	.43
May	1,778,100	263,200	98.79	204,700	66.5	136,300	.38
June	1,897,800	254,200	98.43	281,300	67.0	188,600	.44
	19,462,500	3,221,200	98.70	2,451,800	64.7	1,586,600	.43

TABLE 4 - VACUUM FILTER OPERATION

Month	Elutriated Sludge Filtered												
	Gallons x1000	% Water	Lbs Solids x1000	Lbs $FeCl_3$	%$FeCl_3$ on Solids	Hours Filter Operated	Lbs Solids Per Hr	Lbs Solids Per Sq Ft Filter Per Hr	Filter Cake% Water	Lbs Cake x1000	Gallons Sludge Filtered Per Hr	Lbs Filtrate Per Hr x1000	CuYd Cake to Park
1941													
July	897.4	97.03	223.8	10140	4.53	216.31	1060	5.30	75.1	926.8	4150	30.5	640
Aug	972.1	97.20	228.2	11220	4.91	224.53	1050	5.25	75.4	955.9	4320	32.1	701
Sept	812.0	97.06	201.0	8700	4.33	196.83	1050	5.25	75.0	826.0	4130	30.6	601
Oct	804.2	97.04	200.4	9420	4.70	199.41	1050	5.25	76.0	887.7	4030	29.6	574
Nov	780.9	97.29	189.6	9480	5.00	192.67	1010	5.05	75.8	808.5	4050	30.0	517
Dec	285.4	96.69	80.0	3320	4.15	95.02	860	4.30	75.6	336.1	3000	21.9	210
1942													
Jan	680.3	96.85	182.1	7040	3.86	162.04	1150	5.75	75.1	750.0	4200	31.1	442
Feb	312.4	96.76	85.4	3120	3.66	79.84	1100	5.55	73.7	332.1	3920	29.0	221
Mar	494.2	96.60	142.5	5080	3.56	123.57	1180	5.90	74.6	560.6	4000	29.5	343
Apr	480.7	96.62	138.0	4170	3.03	116.48	1200	6.00	73.6	533.1	4130	30.4	367
May	509.9	96.81	135.5	4170	3.08	128.56	1080	5.04	74.1	534.3	3890	28.8	380
June	794.8	97.00	200.4	7870	3.92	188.67	1110	5.55	74.6	826.7	4210	31.0	490
	7824.3	96.96	2006.9	83730	4.17	1923.93	1070	5.35	75.0	8277.8	4070	30.0	5486

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

The operation and maintenance of the Richmond-Sunset Sewage Treatment Plant continued throughout the fiscal year ending June 30, 1943, the fourth full year of operation.

War conditions were manifested by an increase in contributory population to an estimated 170,000 compared with an estimated 150,000 in 1940, a gain of 13%. Shortage of manpower was distinctly felt as a result of entrance of experienced men into the armed forces and Merchant Marine. Numerous changes in plant personnel made plant operation and maintenance more difficult, and resulted in some curtailment of laboratory work. All required air raid precautions were complied with, and all warnings followed both day and night in order to be prepared for possible attack.

The quantities of sewage treated were 1,705.9 million gallons gravity flow from the Richmond District, and 1,269.8 million gallons pumped flow from the Sunset District for a total of 2,975.7 million gallons. Storm water was by-passed for a period equivalent to 46.7 days for the Sunset District, and 0.67 days for the Richmond District. The average daily flow for the year was 9.5 million gallons for the time when the plant actually operated, with average daily wet and dry weather flows of 10.4 and 8.5 million gallons respectively. A total of 14,195 cubic feet of screenings, 2,452 cubic yards of grit, and 2,746 tons of dry sewage solids were removed, and 3,917 tons of filter cake, amounting to 923 tons of dry solids, produced. The 4,845 cubic yards of filter cake delivered to city parks and municipal golf courses for use as fertilizer were estimated to have a value of $19,600.

Satisfactory sanitary conditions of the shore waters along the Great Highway, China and Baker's Beaches continued, as shown by bacteriological examinations for coliform organisms by the Department of Public Health.

During the year, the practice of a planned plant shutdown for a limited period during the winter rainy season for general plant overhaul was instituted to assure dependable operations during the critical period from April through November. All mechanical equipment was inspected, adjusted, and repaired where necessary; channels, conduits and tanks were inspected and sand deposits removed. It is believed that this practice is desirable, and should be continued in the future.

Pre-treatment

The bar racks were in continuous operation during the year. A burnt-out stator in one of the motors was rewound and rebaked, and a defective cable replaced. Air diffusion lines were installed in the channels in front and in back of the bar racks to prevent deposition of sand. The practice of screenings incineration started last year was continued.

Grease removal in the grit-grease tank was satisfactory. As in previous years, however, grit removal was incomplete, some very fine sand being carried over in the mixing and sedimentation tanks. This situation may be expected to improve when the other two grit-grease tanks are equipped for service, as indicated in previous years. All control valves on the air header to the diffusers were overhauled. The sand scraper chains, which showed considerable wear, were turned over and the rubber scrapers adjusted and replaced where necessary. The diffuser plates were re-caulked with lead wool and four diffuser plates replaced. The balance were cleaned with dichromate-sulphuric acid mixture, resulting in improvement in air permeability. All underwater surfaces were re-painted with a bituminous coating.

The by-pass channel after the bar racks was resurfaced to grade. A broom closet was constructed on the main floor, and a work bench installed in the chlorinator room. The sand pump wearing rings and impellers were renewed when necessary.

Sludge Control and Sedimentation

The flocculating tanks were drained and sand removed twice during the year. Considerable wear due to sand abrasion was observed in the underwater mechanical equipment. The paddle shafts were jacked over to obtain better meshing of drive pinions and bevel gears, and the drive chains turned over.

The water sprays for removing floating material from the sedimentation tanks were operated intermittently because of over heating of the pump motor when operated continuously. The effluent troughs in the sedimentation tanks were wire brushed and painted with a bituminous coating.

Based on incomplete laboratory data, the yearly average raw sewage suspended solids were 265 ppm* and plant effluent 65 ppm, removal 75%; corresponding 5-day biochemical oxygen demands were 240 ppm and 120 ppm, removal 50%.

Chlorination

Pre-chlorination for odor control at the rate of 30 pounds per million gallons was continued throughout the year. Post-chlorination was used except during storms from April through December at a variable rate from 80 to 100 pounds per million gallons to maintain an average residual of 0.5 ppm after a contact period of 5 minutes. The post-chlorinator was disassembled and completely overhauled, and the master vacuum control repaired. Both converters for automatic control of chlorine feed were adjusted for better response to variations in sewage flow. The low pressure chlorine alarm bell was overhauled,

*parts per million

and the flash mixer motor rewound and new couplings installed.

Sludge Digestion

During most of the year satisfactory stratification in the digester could not be obtained because of insufficient capacity. Overloading of the digester was reflected in gradually increasing volatile content of the digested sludge, averaging 67.8% for the year as compared with 64.7% in the preceding year. Temperatures ranged from 85 to 90° F. Gas generation was variable, increasing to a maximum during the summer months. The metered production averaged about 0.6 cubic feet per day per capita of connected population, not accounting for gas leakage through the digester seal. A float gauge was installed in the supernatant overflow vent pipe as a supplementary check on liquid height in the digester.

Elutriation and Sludge Filtration

All sludge withdrawn from the digester was washed in the elutriation tanks. No records of alkalinity reduction are available because of the lack of necessary laboratory data. A greater proportion of supernatant was withdrawn from the digester than in previous years resulting in thinner sludge and some increased carry-over of elutriated sludge with the tank overflow.

Sludge dewatering continued regularly throughout the year. An increase in the average ferric chloride dose required to condition elutriated sludge prior to filtration to 5.4% for the year was a direct result of higher moisture and volatile content of the elutriated sludge. Incrustations were again removed from the filter screen with inhibited hydrochlorid acid, and a new scraper installed.

Sand deposits were removed from the elutriation tanks and mixers, the filter vacuum pump was cleaned and overhauled, and leaks in the bituminous linings of the ferric chloride make-up tanks repaired.

Sunset Pumping Station

The plant operated continuously except for the usual bypassing during storms. Periodic pumping down and flushing of the sump was continued. The small sewage pump was completely overhauled and new wearing rings, impeller, shaft and bearings installed.

Laboratory

Laboratory work was severely curtailed during the year because of lack of trained personnel. About 4000 routine and special analyses were made during the year. Daily analyses were made only for moisture and volatile content of raw, digested, and elutriated sludges, and strength of ferric chloride solutions used for vacuum filtration. Only occasional suspended solids and 5-day biochemical oxygen demands were determined on 24-hour composites of raw sewage and effluent. No analyses of monthly composite samples of filter cake for fertilizer constituents were made. The reduction in laboratory work was a serious handicap to the efficient operation of the plant.

Miscellaneous Maintenance and Improvements

Painting during the year was confined largely to spray water piping in the grit-grease and sedimentation tanks, sand washers, filter cake storage hoppers, and the underwater equipment mentioned above.

To comply with dim-out regulations shades were installed in windows and skylights in the Main and Pre-Treatment Buildings, and a pipe constructed to vent unburned waste gas from sunset to sunrise at an elevation approximately 25 feet above ground level. This seemed to be the most practical method, under the emergency conditions, of eliminating glare from the waste gas burner flame, and minimizing any possible explosion hazard.

A barbed wire topped fence was constructed around the Mile Rock sewer bar rack to prevent access by unauthorized persons. A pipe line was installed from the digester hot water circulating pumps to furnish water at an adequate pressure for lifting the movable gate in the Mile Rock sewer in case of failure of the main air supply, and defective cable on the hoist renewed.

The conveyor belt from the Sunset sand washer to the storage bin was renewed and the sand bin operating chain lowered to clear the conveyor belt. All U-bolts and shackles in the filter cake storage bins were inspected and defective ones replaced. The main water line check valve and valve pits were lined with concrete.

Summaries of main plant operating data for the fiscal year are given in Tables 1 to 4.

RICHMOND-SUNSET SEWAGE TREATMENT PLANT

COST OF OPERATION

1942-1943

Item of Expenditure	Total Plant Operation	Sewage Treatment with Chlorination	Sunset Pumping Plant	Sludge Disposal Conditioning & Filtration	Sewage Treatment without Chlorination
Permanent Salaries	$32,803	$21,401	$ 4,364	$ 7,038	$19,479
Temporary Salaries	1,927	1,106	318	503	1,062
Wages	7,823	3,700	960	3,163	3,440
Contractual Services	3,942	3,032	440	470	2,929
Heat, Light & Power	9,333	4,293	4,380	660	3,903
Plant Chemicals	10,658	7,578	-	3,080	-
Materials & Supplies	7,423	5,703	961	759	5,000
Total	$73,909	$46,813	$11,423	$15,673	$35,813

Richmond Flow - 1,706 M.G.
Sunset Flow - 1,270 M.G.
Total 2,976 M.G.

Cost operation per M.G.	$24.84	$15.73	$3.84	$5.27	$12.03

Estimated cost per capita (based on 170,000 population) 0.45 per yr.

3,920 tons fertilizer estimated value $19,600 delivered to City Parks during year.

Additional Expenditures

Plant Improvements	$682
Painting	588
	$1,270

The Sunset flow was by-passed and the Sunset Pumping Plant shut down during storms to prevent overflow from the storm sewers, and to avoid handling excessive quantities of sand in the sump.

TABLE 1 - FLOW AND PRE-TREATMENT DATA

Month	Flow MG			Days By-Passed		Rain	Screen-ings	(a) Grease Gallons	Sand Cu Yd		Chlorination Lbs		Sewage Temp
	Richmond	Sunset	Total	Rich-mond	Sun-set	Inches	Cu Ft	Pumped	Pre-Treat.	Sun-set	Pre	Post	°F
July 1942	142.2	126.2	268.4	.02	.34		1319	25000	91	54	8040	18780	68
Aug.	140.1	124.2	264.3				1350	26300	74	40	7930	16390	68
Sept.	126.6	119.0	245.6		1.00	.13	1350	27000	108	80	7320	20400	69
Oct.	154.8	119.5	274.3		3.38	1.01	1345	27100	152	85	7770	16310	69
Nov.	165.6	94.3	259.9	.08	10.71	3.79	1193	22700	193	72	7280	11650	67
Dec.	170.9	96.0	266.9		8.62	3.34	1265	23500	204	89	6750	13800	64
Jan. 1943	115.1	84.5	199.6	9.75	12.80	6.76	945	18700	126	52	5320	-	63
Feb.	57.0*	16.3	73.3*	19.00	25.45	2.75	250	3500	39	5	1710	-	62
Mar.	179.2	109.0	288.2		11.62	3.79	1133	23700	156	40	8370	-	61
Apr.	153.5	128.7	282.2	1.00	2.51	2.02	1300	26100	179	84	8240	17740	64
May	166.2	129.6	295.8		.51	.25	1395	27900	171	135	6860b	22290	68
June	134.7	122.5	257.2		.62	.21	1350	27000	133	90	1850b	21950	68
	1705.9	1269.8	2975.7	29.85	77.56	24.05	14195	278500	1626	826	77440	159310	66

(a) Approximate removal from grit-grease tanks; does not include additional removals in Mixing and Sedimentation Building.

* Estimated

By-Passing - Richmond 0.67 days, rain; 29.18 days for sand removal, repairs, power failure, etc.
Sunset 46.67 days, rain; 30.89 days for sand removal, repairs, power failure, etc.

Pre-Chlorination - 30 lbs. per MG. (b) Off May 25th through June 23d for repairs to chlorinator.

Post-Chlorination- 9 A.M. - 6 P.M. 100 lbs. per MG
6 P.M. - 9 A.M. 80 lbs. per MG

No Post-Chlorination during winter season nor when Sunset flow by-passed.

TABLE 2 - SLUDGE TO DIGESTER AND GAS PRODUCTION

	Raw Sludge to Digester					Gas Production Cu Ft			
Month	Gallons	% Water	Lbs Dry Solids	% Volatile	Lbs Volatile	To Boilers	To Waste	(a) Total	Digester Temp °F
July 1942	1,634,400	95.63	599,900	82.0	491,900	1,455,200	1,765,500	3,220,700	88
Aug.	1,654,200	95.61	609,900	83.1	506,700	1,336,300	1,894,100	3,230,400	88
Sept.	1,796,100	95.61	662,600	83.3	551,300	1,255,500	1,955,600	3,211,100	87
Oct.	1,639,300	95.74	586,400	83.4	489,500	1,392,800	1,810,100	3,202,900	87
Nov.	1,206,700	96.05	400,100	84.9	340,100	1,472,900	1,612,900	3,085,800	88
Dec.	1,109,900	95.47	422,000	84.4	356,400	1,629,700	1,473,300	3,103,000	87
Jan. 1943	902,600	95.48	343,000	85.4	292,900	1,282,700	1,100,900	2,383,600	85
Feb.	178,000	95.59	65,900	80.8	53,200	334,600	114,700	449,300	90
Mar.	984,500	95.68	357,200	84.9	303,400	1,584,900	1,136,200	2,721,100	89
Apr.	1,122,900	95.39	435,500	85.2	371,700	1,385,400	1,351,000	2,736,400	87
May	1,466,400	95.85	510,900	83.8	428,400	1,483,500	1,351,700	2,835,200	87
June	1,444,300	95.89	498,800	83.6	416,700	1,420,400	*1,167,300	*2,587,700	87
	15,139,300	95.68	5,492,200	83.8	4,602,200	16,033,900	16,733,300	32,767,200(a)	88

* Estimated

(a) Does not account for gas leakage at digester seals.

Sludge is withdrawn by gravity approximately ten times per day from the sedimentation into the thickening tanks and allowed to settle without mechanism. The supernatant is returned to the mixing tanks and thicker sludge pumped to the digester approximately six times per day.

During the winter months, the quantity of sludge removed and its per cent volatile is materially less than during normal operation.

TABLE 3 - DIGESTED SLUDGE TO ELUTRIATION TANKS

Month	Supernatant Gallons	Bottom Gallons	Average % Water	Lbs Dry Solids	Average % Volatile	Lbs Volatile	Solids To Elut. / Solids To Dig.
July 1942	1,579,200	370,400	98.25	283,500	66.1	187,200	.47
Aug	1,651,000	182,300	98.20	274,300	67.2	184,600	.45
Sept	1,808,800	219,500	98.12	317,000	68.5	217,400	.48
Oct	1,804,300	69,300	98.26	271,200	68.4	185,200	.46
Nov	1,355,500	106,700	98.60	170,200	68.5	116,600	.43
Dec	1,306,300	73,800	98.47	176,200	67.8	119,400	.42
Jan 1943	1,090,000	0	98.09	173,100	68.8	119,100	.50
Feb	190,600	37,800	98.79	23,100	65.4	15,100	.35
Mar	980,100	218,600	98.30	170,000	65.8	111,800	.48
Apr	1,236,600	154,500	98.38	187,500	67.6	126,900	.43
May	1,399,400	196,900	98.29	227,700	68.5	155,900	.45
June	1,620,600	42,700	98.03	273,000	68.4	186,700	.55
	16,022,400	1,672,500	98.27	2,546,800	67.8	1,725,900	.46

TABLE 4 - VACUUM FILTER OPERATION

	Elutriated Sludge Filtered												
Month	Gallons x1000	% Water	Lbs Solids x1000	Lbs FeCl$_3$	%FeCl$_3$ on Solids	Hours Filter Operated	Lbs Solids Per Hr	Lbs Solids Per Sq Ft Filter Per Hr	Filter Cake% Water	Lbs Cake x1000	Gallons Sludge Filtered Per Hr	Lbs Filtrate Per Hr x1000	CuYd Cake to Park
1942													
July	882.8	96.99	222.9	10380	4.65	210.55	1090	5.45	74.4	898.2	4190	30.9	574
Aug	827.1	97.08	202.5	9760	4.81	195.76	1070	5.35	75.2	844.7	4220	31.1	497
Sept	800.1	97.47	170.2	7970	4.68	189.25	930	4.65	75.6	719.4	4230	31.7	441
Oct	873.9	97.40	190.2	10610	5.58	208.56	950	4.75	75.4	802.5	4190	31.3	504
Nov	557.5	97.32	124.5	7210	5.79	134.38	960	4.80	76.4	547.0	4150	30.7	311
Dec	584.7	97.03	146.1	6760	4.62	139.86	1080	5.40	76.9	651.7	4180	30.4	406
1943													
Jan	518.6	97.23	120.8	5570	4.61	124.39	1000	5.00	76.4	529.1	4160	30.7	322
Feb	25.4	96.91	6.6	460	6.88	6.45	1080	5.40	76.3	29.2	3930	28.5	14
Mar	545.9	96.90	142.4	8230	5.78	136.26	1080	5.40	75.8	610.1	4000	29.2	378
Apr	672.8	97.00	169.9	9410	5.54	168.83	1040	5.20	75.6	723.2	3980	29.3	448
May	760.5	97.34	170.2	10610	6.23	198.95	890	4.45	74.6	697.1	3820	28.6	476
June	854.0	97.50	179.9	11850	6.59	216.45	870	4.35	76.0	781.3	3940	29.6	474
	7903.3	97.22	1846.2	98820	5.35	1929.69	990	4.95	75.6	7833.5	4100	30.4	4845

MARINA SEWAGE PUMPING STATION

All mechanical equipment, pumps, and motors were cleaned and painted. Pump #4 was opened to remove a wood block which was caught in the impeller. A new shaft was installed in pump #2; pump #3 was completely overhauled; and all pumps were repacked four times during the year. New gaskets replaced the old ones on all check valves, and the water seal pumps were replaced by reconditioned pumps.

COMMERCIAL STREET SEWAGE PUMPING STATION

The servicing of the recording watt meter included the renewal of several parts and recalibration. The discharge gate valves and check valves were overhauled. Routine maintenance included cleaning the sump every three months and repacking the pumps as needed.

VICENTE SEWAGE PUMPING STATION

Heater strips were placed near the motors of both pumps to keep the motor windings dry while in operation. Both pumps were completely overhauled and repacked.

SEA CLIFF SEWAGE PUMPING STATION #2

Routine maintenance included repacking all pumps and the replacement of gaskets on check valves. The exterior of doors and window trim were cleaned and painted. Miscellaneous facilities such as hose racks, chart cabinet, and hanger hooks for tools were installed.

MARINA SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - 66,500 DISTRICT AREA - 1,025 ACRES

Month	PUMPAGE IN MILLION GALLONS:				Power Consumed by Pumps K. W. H. Per Mo.	Power Consumed by Pumps cost Per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons Per Month	K. W. H. per Million Foot Gallons
	Total per Month	Daily aver-age	Max. per Day	Min. per Day					
July 1941	124.0	4.066	No data Available		23,220	$ 348.30	41.5	5,146	4.51
Aug.	135.9	4.456			25,290	379.35		5,640	4.49
Sept.	138.6	4.544			26,440	396.60		5,752	4.59
Oct.	150.6	4.938			28,990	434.85		6,250	4.64
Nov.	159.6	5.233			30,520	457.80		6,623	4.61
Dec.	165.0	5.410			31,460	471.90		6,848	4.60
Jan. 1942	165.0	5.410			30,950	464.25		6,848	4.52
Feb.	141.6	4.643			26,950	404.25		5,876	4.59
Mar.	164.2	5.384			29,660	444.90		6,814	4.36
Apr.	165.0	5,410			31,640	474.60		6,848	4.62
May	154.8	5.075			29,620	444.30		6,424	4.61
June	136.2	4.466			26,190	392.85		5,652	4.62
Total Per Year	1,800.5	4.920			340,930	$5,113.95		74,721	4.56 (Average)

69% Average overall efficiency of each pump and its motor.

COMMERCIAL ST. SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA - 92.5 ACRES

	PUMPAGE IN MILLION GALLONS:								
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day	Power Consumed by Pumps K: W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1941	15.20	.498			2,880	$ 57.60	26.5	402.8	7.14
Aug.	13.05	.428	No data Available		2,470	49.40		345.8	7.16
Sept.	13.30	.436			2,520	50.40		352.5	7.16
Oct.	13.95	.457			2,640	52.80		369.7	7.16
Nov.	12.50	.410			2,370	47.40		331.3	7.17
Dec.	17.10	.561			3,240	64.80		453.2	7.17
Jan. 1942	15.65	.513			2,960	59.20		414.7	7.17
Feb.	14.05	.461			2,660	53.20		372.3	7.16
Mar.	14.30	.469			2,710	54.20		379.0	7.16
Apr.	14.05	.461			2,660	53.20		372.3	7.16
May	13.95	.457			2,640	52.80		369.7	7.16
June	14.15	.464			2,680	53.60		375.0	7.16
Total Per Year	171.25	.468	(Daily (Average		32,430	$648.60		4,538	7.16 (Average

44% Average overall efficiency of each pump and its motor.

VICENTE SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA - 51.4 ACRES

	PUMPAGE IN MILLION GALLONS:								
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1941	3.71	.122			1,380	$ 27.60	45	167.0	8.27
Aug.	4.12	.135	No data Available		1,530	30.60		185.4	8.27
Sept.	3.33	.109			1,240	24.80		149.9	8.30
Oct.	3.33	.109			1,240	24.80		149.9	8.30
Nov.	4.54	.149			1,690	33.80		204.3	8.29
Dec.	6.33	.208			2,360	47.20		284.9	8.29
Jan. 1942	7.41	.243			2,760	55.20		333.5	8.30
Feb.	7.25	.238			2,700	54.00		326.3	8.30
Mar.	6.96	.228			2,590	51.80		313.2	8.28
Apr.	6.82	.224			2,540	50.80		306.9	8.28
May	6.04	.199			2,250	45.00		271.8	8.29
June	3.96	.130			1,470	29.40		178.2	8.25
Total Per Year	63.80	.175 (Daily (Average			23,750	$475.00		2,871	8.29

38% Average overall efficiency of each pump and its motor.

SEACLIFF SEWAGE PUMPING STATION NO. 2

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA 83.4 ACRES

Month	PUMPAGE IN MILLION GALLONS: Total per Month	Daily average	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1941	3.45	.113	.196	.077	1,655.5	$ 33.11	104.2	359.5	4.61
Aug.	3.72	.122	.147	.098	1,809.5	36.19		387.6	4.66
Sept.	4.65	.152	.285	.093	1,895.5	37.91		484.5	3.92
Oct.	4.53	.149	.297	.097	2,072.3	41.45		472.0	4.38
Nov.	4.38	.144	.294	.095	2,004.6	40.09		456.4	4.38
Dec.	4.37	.143	.264	.036	2,098.8	41.98		455.4	4.61
Jan. 1942	3.92	.129	.262	.019	1,840.0	36.80		408.5	4.52
Feb.	1.49	.049	.295	.000	715.5	14.31		155.3	4.60
Mar.	1.42	.047	.168	.000	669.0	13.38		148.0	4.71
Apr.	3.49	.114	.211	.015	2,216.3	44.33		363.7	6.10
May	3.89	.128	.232	.046	2,322.6	46.45		405.3	5.74
June	4.13	.135	.201	.030	2,153.8	43.08		430.3	5.00
Total Per Year	43.44	.119	(Daily (Average		21,453.4	$429.08		4,526.5	4.77 (Average

66% Average Overall Efficiency of each Pump and its Motor.

1942-43

MARINA SEWAGE PUMPING STATION

The cleaning and painting program included painting the pumps, motors, overhead rail in the control room, entrance stairs to the plant, air duct and pressure tank in control room, water seal pumps and tanks, air ducts in the pump room, also conduit and water pipes and railing in sump room. Cracks which had developed in the wall of the pump room were sealed and waterproofed; all holes in air ducts coming from sump room were patched. A new electric water heater was installed in the fan room, and the Bailey flow meter completely overhauled and recalibrated. All pumps were repacked three times during the year. The motor on pump #3 was completely rebuilt; the bearings on pumps #2, #4, and #5 were replaced; and the telemeter equipment and the small sump pumps overhauled.

COMMERCIAL STREET SEWAGE PUMPING STATION

Maintenance included miscellaneous repairs and painting of equipment; guides and support for the strainer basket were replaced; pumps #2 and #3 were overhauled, and a new shaft was installed in pump #2.

VICENTE SEWAGE PUMPING STATION

New rings and bearings were installed in pump #1, and both pumps were repacked, as needed. Pumps, motors and mechanical equipment were cleaned and painted.

SEA CLIFF SEWAGE PUMPING STATION #2

All mechanical equipment, pumps, motors, piping, doors, and window trim were cleaned and repainted. Electric unit heaters which deteriorated were replaced by new heaters designed especially to withstand salt air. Sewage and water seal pumps were repacked during the year and new teeth put in the trituator.

MARINA SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - 65,000

DISTRICT AREA - 1,025 ACRES

	PUMPAGE IN MILLION GALLONS:								
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1942	148.5	4.869			27,710	$ 415.65	41.5	6,163	4.50
Aug.	140.3	4.600	No data available		26,280	394.20		5,822	4.51
Sept.	137.2	4.498			25,970	389.55		5,694	4.56
Oct.	153.7	5.039			29,100	436.50		6,379	4.56
Nov.	162.2	5.318			30,660	459.90		6,731	4.57
Dec.	153.4	5.030			29,200	438.00		6,366	4.59
Jan. 1943	156.9	5.144			29,670	445.05		6,511	4.56
Feb.	151.3	4.961			29,360	440.40		6,279	4.68
Mar.	161.8	5.305			30,760	461.40		6,715	4.57
Apr.	122.9	4.030			23,300	349.50		5,100	4.57
May	135.2	4.433			25,770	386.55		5,611	4.59
June	138.8	4.551			26,770	401.55		5,760	4.65
Total Per Year	1,762.2	4.815.(Daily (Aver.			334,550	$5,018.25		73,131	4.57 (Average)

69% Average overall efficiency of each pump and its motor.

COMMERCIAL STREET SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA - 92.5 ACRES

	PUMPAGE IN MILLION GALLONS:								
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. Per Mo.	Power Consumed by Pumps cost Per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1942	15.12	.496	No data Available		2,860	$ 57.20	26.5	400.7	7.14
Aug.	14.22	.468			2,690	53.80		376.8	7.13
Sept.	14.50	.476			2,740	54.80		384.3	7.12
Oct.	13.60	.446			2,570	51.40		360.4	7.14
Nov.	14.50	.476			2,740	54.80		384.3	7.14
Dec.	17.56	.576			3,320	66.40		465.3	7.14
Jan. 1943	17.46	.574			3,300	66.00		462.7	7.14
Feb.	15.84	.520			2,990	59.80		419.8	7.14
Mar.	17.92	.588			3,380	67.60		474.9	7.13
Apr.	17.56	.576			3,320	66.40		465.3	7.13
May	17.56	.576			3,320	66.40		465.3	7.13
June	19.54	.641			3,690	73.80		517.8	7.13
Total Per Year	195.4	.534	(Daily (Average		36,920	$738.40		5,178	7.14 (Average)

44% Average overall efficiency of each pump and its motor.

VICENTE SEWAGE PUMPING STATION

CONTRIBUTING POPULATION - NO DATA AVAILABLE

DISTRICT AREA - 51.4 ACRES

Month	PUMPAGE IN MILLION GALLONS:				Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons Per Month	K. W. H. per Million Foot Gallons
	Total per Month	Daily aver-age	Max. per Day	Min. per Day					
July 1942	4.644	.152			1,720	$34.40	45	209.0	8.25
Aug.	4.428	.145	No data Available		1,640	32.80		199.0	8.25
Sept.	4.482	.147			1,660	33.20		201.7	8.25
Oct.	5.184	.170			1,920	38.40		233.3	8.25
Nov.	4.536	.149			1,680	33.60		204.1	8.25
Dec.	4.914	.161			1,820	36.40		221.1	8.25
Jan. 1943	5.238	.172			1,940	38.80		235.7	8.25
Feb.	6.318	.207			2,340	46.80		284.3	8.25
Mar.	6.102	.200			2,260	45.20		274.6	8.25
Apr.	4.320	.142			1,600	32.00		194.4	8.25
May	2.916	.096			1,080	21.60		131.2	8.25
June	3.024	.099			1,120	22.40		136.1	8.25
Total Per Year	56.1	.153 (Daily			20,780	$415.60		2,525	8.25 (Average)

38% Average overall efficiency of each pump and its motor.

SEACLIFF SEWAGE PUMPING STATION NO. 2

CONTRIBUTING POPULATION - 2,234

DISTRICT AREA - 83.4 ACRES

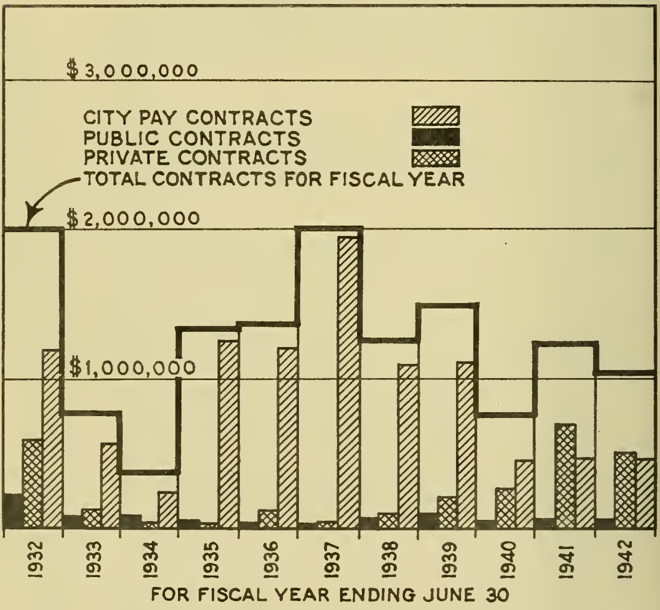
	PUMPAGE IN MILLION GALLONS:								
Month	Total per Month	Daily aver-age	Max. per Day	Min. per Day	Power Consumed by Pumps K. W. H. per Mo.	Power Consumed by Pumps cost per Mo.	Net Operating Head at Pump. Feet	Million Foot Gallons per Month	K. W. H. per Million foot Gallons
July 1942	3.71	.122	.158	.104	1,783.8	$ 35.68	104.2	387	4.60
Aug.	3.41	.112	.148	.092	1,768.6	35.37		355	4.98
Sept.	3.53	.116	.142	.099	1,756.4	35.13		368	4.78
Oct.	3.57	.117	.193	.083	1,762.2	35.24		372	4.74
Nov.	3.49	.115	.200	.032	2,035.8	40.72		364	5.60
Dec.	3.61	.118	.244	.043	1,959.8	39.20		376	5.21
Jan. 1943	2.79	.092	.216	.036	1,529.4	30.59		291	5.26
Feb.	1.57	.052	.348	.014	960.2	19.20		164	5.88
Mar.	4.91	.161	.555	.080	2,848.6	56.97		512	5.56
Apr.	3.71	.122	.168	.097	2,031.6	40.63		387	5.25
May	4.04	.132	.274	.116	2,080.6	41.61		421	4.96
June	3.92	.128	.231	.113	1,895.4	37.91		408	4.64
Total Per Year	42.26	.115	(Daily (Average		22,411.6	$448.20		4,405	5.12 (Average)

61% Average overall efficiency of each pump and its motor.

WORK PERFORMED UNDER CONTRACT
For fiscal year 1941-1942

Sewers		$ 14,905
Bridges		27,636
Boulevards and streets		
Paid by City	$ 416,379	
Public Assessment	67,462	
Private Contract	495,075	978,916
		$1,021,457

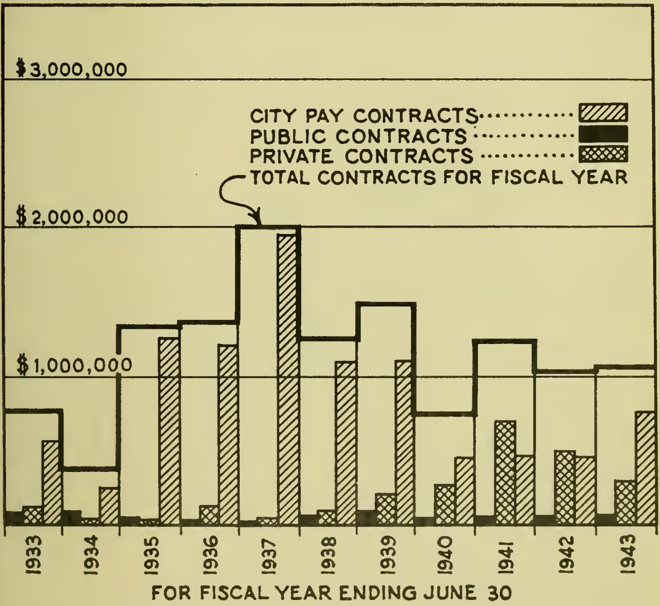
STREET WORK PERFORMED UNDER CONTRACT 1932 TO 1942 INCLUSIVE



WORK PERFORMED UNDER CONTRACT
For fiscal year 1942-1943

Sewers		$ 112,504
Bridges		70,284
Boulevards and streets		
Paid by City	$ 560,955	
Public Assessment	32,358	
Private Contract	287,775	881,088
		$1,063,876

STREET WORK PERFORMED UNDER CONTRACT 1933 TO 1943 INCLUSIVE



STREET IMPROVEMENT ASSESSMENTS, ETC.

FISCAL YEAR 1941-1942

ASSESSMENTS AND BONDS FOR STREET WORK

Assessments issued for cost of street work performed	18
Cost of street improvements covered by assessments	$149,919.32
Bonds prepared (in triplicate)	16
Amount of assessments guaranteed by bonds	$ 11,890.68
Average amount guaranteed by each bond	$ 743.17
Receipts for bond payments issued	211
Amount of bond payments collected	$ 13,865.64

STREET WORK PROCEEDINGS

Resolutions of Intention passed	22
Street improvements recommended under Resolution of Intention	20
Notices of Street Improvement posted	419
Notices of Resolution of Intention mailed	550
Ordinances ordering performance of street improvements passed	21
Proposals for street improvements published	26
Awards of Contract for street improvements published	22
Notices of Recordation posted	230
Notices of Recordation mailed	336
Private contracts granted	32

NOTICES, PERMITS, AND INVESTIGATIONS

Notices to construct or repair sidewalks	3011
Notices to construct bulkheads	44
Notices to remove obstructions	408

Notices to obtain curb lowering permits	142
Notices to construct guard rails	7
Notices to obtain oil tank permits	6
Notices to reconstruct side sewer traps	2
Notices to replace side sewer cover	84
Notices to obtain street space permits	345
Street space permits reported on	738
Oil tank permits reported on	29
House moving permits reported on	23
Miscellaneous calls and investigations	4,603
Blasting bonds set and jobs supervised	3
Curb lowering permits	638
Notices to reconstruct area walls, set back side sewer traps and oil tanks and reconstruct sidewalk doors in connection with the widening of the roadways of streets by reducing the sidewalk widths	62

PERMITS AND FEES FOR CORPORATION TRENCHES

	Permits	Lin. Ft.	Fees
Pacific Gas & Electric Co.	2,866	53,921	$4,368.00
San Francisco Water Department	4,294	5,199	6,480.00
Pacific Tel. & Tel. Company	112	12,739	264.00
Postal Telegraph Company	-	-	-
Pac. Pipe Line Const. Co.	1	8,258	48.00
Western Union	1	690	6.00

SPECIAL PERMITS

	Number	Fees
Oil Tanks	24	$ 78.00
Curb Lowering	638	3,274.50
Street Space	738	7,832.70
House Moving	23	46.00
Sub-sidewalk	-	-
Oil Tank Permits Reported on	29	-

STREET IMPROVEMENT ASSESSMENTS, ETC.

Fiscal Year 1942-1943

ASSESSMENTS AND BONDS FOR STREET WORK

Assessments issued for cost of street work performed	15
Cost of street improvements covered by assessments	$133,038.41
Bonds prepared (in triplicate)	37
Amount of assessments guaranteed by bonds	$ 10,047.98
Average amount guaranteed by each bond	$271.57
Receipts for bond payments issued	215
Amount of bond payments collected	$ 18,457.28

STREET WORK PROCEEDINGS

Resolutions of Intention passed	5
Street improvements recommended under Resolution of Intention	5
Notices of Street Improvement posted	285
Notices of Resolution of Intention mailed	394
Ordinances ordering performance of street improvements passed	2
Proposals for street improvements published	2
Notices of Recordation posted	166
Notices of Recordation mailed	356
Private contracts granted	13

NOTICES, PERMITS, AND INVESTIGATIONS

Notices to construct and repair sidewalks	2241
Notices to construct bulkheads	32
Notices to remove obstructions	401
Notices to obtain curb lowering permits	112

Notices to construct guard rails	6
Notices to obtain oil tank permits	4
Notices to reconstruct side sewer traps	1
Notices to replace side sewer covers	72
Notices to obtain street space permits	242
Street space permits reported on	164
Oil tank permits reported on	38
House moving permits reported on	13
Miscellaneous calls and investigations	3387
Blasting bonds set and jobs supervised	8
Curb lowering permits	111
Notices to reconstruct area walls, set back side sewer traps and oil tanks and reconstruct sidewalk doors in connection with the widening of the roadways of streets by reducing the sidewalk widths	52

PERMITS AND FEES FOR CORPORATION TRENCHES

	Permits	Lin. Ft.	Fees
Pacific Gas & Electric Company	1,184	18,490	$1,848
San Francisco Water Department	3,776	2,161	5,685
Pacific Tel. & Tel. Company	57	2,016	10,350
Postal Telegraph Company	-	-	-
Western Union	2	-	3

SPECIAL PERMITS

	Number	Fees
Oil Tanks	29	$ 56
Curb Lowering	111	825
Street Space	164	2,059
House Moving	13	26
Sub-sidewalk	-	-
Oil Tank Permits Reported on	38	-

DIVISION OF GRADES
Fiscal Year 1941-1942

Plans were prepared for the improvement of 25th Street between De Haro Street and Wisconsin Street, also De Haro Street from 25th Street northerly. The design included the narrowing of sidewalks to six feet with divided roadways, special treatment of slopes between roadways, and retaining walls. On De Haro Street the homes were built before the street was improved or grades established and in some places the east side of the street is about 22 feet higher than the west side.

Grades were changed and established on streets and crossings covering 43 blocks in several sections of the city.

Grade changes were made for the widening of Third Street from 23d Street to Burke Avenue.

Because of shifting sands, grade changes were made in several blocks in the Sunset District, thereby saving the property owners considerable grading costs.

A topographical map of the unimproved area bounded by Silver Avenue, Industrial Street, Revere Avenue, and Bayshore Boulevard was made for the purpose of determining suitable grades for future development.

Sidewalk width reductions were principally in the Potrero industrial section to provide additional traffic lanes when streets are improved.

The sidewalks were abolished on the streets surrounding the Union Square Garage. This was done to give a free traveling lane in and out of the garage. The pedestrian travel along these streets was provided for within the Union Square Park area.

DIVISION OF GRADES
Fiscal Year 1942-1943

Grade changes requiring special treatment of slope areas were made on Quesada Avenue, Quint Street, and Revere Avenue. After passage of the ordinance reestablishing the grades, a special map was made showing all changes and was filed in the office of the Recorder.

Sidewalk widths were reduced and widths established on streets and crossings covering eleven blocks. Maps were drawn, and filed, showing the changes in sidewalk widths on Mangels Avenue, Melrose Avenue, Congo Street, and Teresita Boulevard, and on Revere Boulevard, southeasterly terminus.

Preliminary studies, investigations, and recommendations were made in several locations where the topography of the district made it necessary to change the official grade and to realign some of the streets. Grade changes and realignments and extensions were made in the following streets: Burnett Avenue, to by-pass a quarry near its northerly terminus and connect same with Twin Peaks Boulevard; westerly portion of San Marcos Avenue and Revere Street, to connect with Funston Avenue; Diamond Street between Thirtieth and Adaline Street; Selby Street and Helena Street; extension of Beacon Street to Thirtieth Street and Castro Street.

Maps were made and tentative grades were set for the improvement of Alpha Street, Goettingen Street, and Tioga Avenue, with a proposed new street connecting Alpha Street and Tioga Avenue.

A survey was made and plans were prepared for the reconstruction of Douglass Street to connect with Corwin Street. The general plan includes retaining walls, upper and lower roadway ramps, and the acquisition of additional property. This improvement will give direct connection to the Market Street extension, via Corwin Street and Stanton Street.

DIVISION OF SURVEYS
Fiscal Year 1941-1942

SURVEYS PERFORMED

For Public Contracts	40	
For Private Contracts	53	
Resurveys for Contracts	34	
For Municipal Departments	235	
Total for Public Improvements		362

LOT SURVEYS

For Private Owners	3	
For Municipal Departments	5	8
Total Surveys		370

Surveys covered approximately 1094 blocks and crossings with a total approximating 420,830 feet, or 79.7 miles, distributed as follows: 65,020 feet of line and grade points for new street and sewer construction; 3,065 feet for W.P.A. surveys; 6,200 feet for block resurveys; 43,050 feet of monument lines; 19,100 feet for subsidence and earth slides; 78,730 feet for topographical surveys at Ocean Beach, Log Cabin Ranch for Boys in San Mateo County, San Francisco Junior College, and Hunters Point; 2,410 feet for Municipal Railway; 130,365 feet for various small Municipal Work Orders; 7,860 feet for Slide Surveys; and 65,030 feet for Miscellaneous Surveys listed below.

In addition, a total of 63 miles of precise levels was run and 2274 bench marks were checked or reestablished; 59 monuments were either set, checked, referenced, or recapped; there were 4 block resurveys which established block boundaries in reference to monument lines and all improvements in these blocks were located.

W.P.A. SURVEYS

O'Shaughnessy Boulevard, from Portola Drive to Bosworth Street
Visitacion Avenue, from Bayshore Boulevard to Schwerin Street

MUNICIPAL RAILWAY SURVEYS

Geary Street, from Third Avenue to Eleventh Avenue

MISCELLANEOUS SURVEYS

Third Street, from Mariposa Street to Army Street
Holloway Avenue, from Nineteenth Avenue Westerly
Visitacion Avenue, from Hahn Street to LaGrande Avenue
Brookdale Avenue and Santos Street
Junipero Serra Boulevard Extension
Lombard Street, from Van Ness Avenue to Richardson Avenue
Log Cabin Ranch for Boys
Aquatic Park at foot of Van Ness Avenue
Sunnydale Housing Project
Market Street, from Valencia Street to Castro Street
Marina Pumping Station
Metropolitan Housing Project, Crespi Drive
High Pressure Mains Testing

PRECISE LEVELS AND BENCH MARKS

District	Bench Marks	Distance - Miles
Sunset	1,062	16.65
100 Vara	503	16.33
Bernal Heights	164	16.36
McLaren Terrace	149	2.66
University Mound	106	2.12
50 Vara	78	2.28
College Homestead	65	1.70
Peoples Homestead	59	.92
Mission	59	1.93
Stonecrest Tract	29	1.70
Total Bench Marks Checked and Reestablished	2,274	Total Miles - 62.65

MAPS APPROVED AND FILED

Bridgeview Terrace Subdivision
Lake Shore Park, Subdivision No. 2
Market Street, from Ord Street to 24th Street - Widening
Marietta Drive in Miraloma Park
Raycliff Terrace

MAPS APPROVED AND FILED (Continued)

- Lipani and Mandan Avenues
- Merced Gardens
- Sunnydale Housing Project
- Brookdale Avenue and Santos Street
- Junior Terrace
- Parker Avenue, widening from Geary Boulevard to Euclid Avenue
- Islais Street, widening from Rankin Street to Napoleon Street
- Selby Street, widening from Evans Avenue to Islais Street
- Stonecrest Subdivision
- Crescent Terrace
- Brookdale Terrace Subdivision
- Madera Street, from Wisconsin Street to Arkansas Street
- Chenery Street, widening at southwest corner of Randall Street

FEES RECEIVED FOR SURVEYS

1941		
July		$3,202.35
August		899.29
September		1,170.00
October		453.23
November		876.88
December		554.91
1942		
January		233.68
February		626.55
March		678.64
April		136.11
May		-
June		734.48
	Total	$9,566.12

DIVISION OF SURVEYS
Fiscal Year 1942-1943

SURVEYS PERFORMED

For Public Contracts	10	
For Private Contracts	13	
Resurveys for Private Contracts	6	
For Municipal Departments	111	
Total for Public Improvements		140

LOT SURVEYS

For Private Owners	1	
For Municipal Departments	5	6
Total Surveys		146

Surveys covered approximately 909 blocks and crossings with a total of 606,830 feet or 114.8 miles, distributed as follows: 14,590 feet of line and grade points for new street and sewer construction; 110,440 feet for other municipal departments on work orders; 16,020 feet for subsidence surveys; 66,240 feet for monument lines; 14,890 feet for block resurveys; 52,980 feet for topographic surveys of slide areas, etc.; 49,000 for surveys in and through Golden Gate Park; 80,995 feet for surveys in connection with Bayshore Boulevard, Lake Merced Boulevard, Junipero Serra Boulevard, and Alemany Boulevard; 15,525 feet for the United States Government; 16,050 feet for soundings in the Bay and at Aquatic Park; 21,360 feet for Ocean Beach surveys; 21,000 feet for sewer surveys in Western Addition area, and 43,910 feet for miscellaneous surveys listed below.

In addition, a total of 30 miles of precise levels was run and 809 bench marks were either set, checked or reestablished; 213 monuments were either set, checked, referenced, or recapped; there were resurveys of 8 blocks in which all improvements were located and which established the block boundaries in reference to monument lines.

Surveys for miscellaneous projects mentioned above:

Pine Lake Park
Lombard Street
Market Street Parking Slab
Metropolitan Housing Project Sewer Tunnel
High Pressure Fire System
Civilian Defense Projects

The Division of Surveys also surveyed one parcel of land for the Fire Department and four parcels for the Recreation Department for a total of 13,470 feet in addition to that listed above.

PRECISE LEVELS AND BENCH MARKS

District	Bench Marks	Distance - Miles
100 Vara	567	22.09
Mission	47	1.30
Potrero	11	0.97
Embarcadero	184	5.45
Total	809	29.81

Precise levels run in the months of April, May, and June, 1943.

MAPS APPROVED AND FILED

24th Street, from Michigan Street to Louisiana Street - widening
Melrose Avenue, from Gennessee Street westerly and Kenyon Avenue from Foerster Street easterly - widening
O'Shaughnessy Boulevard, from Portola Drive to Bosworth Street
San Bruno Avenue, Third Street and Campbell Avenue - widening
Stanton Street and Corwin Street - opening
Bay Street, from Larkin Street to Hyde Street - widening
Otis Street and McCoppin Street - widening
Badger Street, from Cayuga Avenue to Calvert Drive - widening
Sixteenth Street, from Seventh Street to Illinois St. - widening
Upper Terrace - Extension
Holloway Avenue - Extension
Pennsylvania Avenue, from 23d Street southerly - widening
Lombard Street, from Richardson Avenue to Van Ness Avenue - widening
Nordhoff Street, extension -- Congo Street and Circular Avenue widening
Wawona Street, realignment between 25th Avenue and 26th Avenue
West View Terrace
Beacon and San Miguel Streets - widening
Elsie Street at Cortland Avenue - widening

FEES RECEIVED FOR SURVEYS

1942	
July	$ 64.27
August	25.00
September	-
October	-
November	84.00
December	1,100.00
1943	
January	-
February	146.29
March	-
April	-
May	64.80
June	32.00
Total -	$1,516.36

OFFICE WORK

In connection with and in addition to the foregoing, the office work included the following:

Data for the use of the surveyors in the field are computed and compiled in the office for each survey. From field surveys, monument lines are adjusted and monument maps drawn. Maps are drawn of street widenings, openings, closings, extensions, etc., which are filed in the office of the County Recorder. All recorded maps showing changes are furnished the Assessor's office for assessment purposes.

The sectional maps of the City and County, totaling 354 sheets, showing all the official data for street name changes, street openings and closings, extensions, widenings, and all property acquired or sold by the City and County of San Francisco, are kept up to date. These maps are on a scale of 1" = 100'.

All appeals from the decisions of the City Planning Commission regarding building zone changes which are presented to the Board of Supervisors are checked to determine if sufficient signatures have been secured to give the Board power to change the decision of the Planning Commission.

All actions referred to the City Attorney to quiet title to land are checked to determine whether any City and County property is involved in such actions.

Other office work consists of computing, writing, and checking all property descriptions for the Real Estate Department; investigating and checking maps of proposed subdivisions; and checking street descriptions for dedication purposes.

Petitions are answered, estimates are made, and information is furnished to various municipal departments and to engineers and surveyors in private practice.

The inquiries made by the public to the office of the Division of Surveys are varied in character and at times require considerable research before they can be fully answered.

Since the entrance of the United States into world hostilities, the Army and Navy Departments have consulted with the City Engineer's office on numerous occasions and a large part of the information given out has come from the office of Division of Surveys.

The strategic location of San Francisco makes it a potential military target for enemy forces; hence it was deemed advisable to microfilm all important maps and records in the City Engineer's office. In the office of Division of Surveys approximately 24,000 pictures on 16 mm film and 2,000 pictures on 35 mm film were taken of indices, monument maps, bench marks, monument ties, sectional maps, and block diagrams.

CURRENT CONTRACT DATA 1941-1942

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/42	Fund
BOULEVARDS, PAVING, GRADING, ETC.							
Bridgeview Drive, (portion) through Southern Pacific property	Eaton & Smith	5/14/41	6/1/42	100	$3,920.35	$1,600.00*	County Road
Carolina St. (portion) Between 22d Street and 23d Street	Eaton & Smith	12/5/41	2/25/42	100	1,484.30	1,484.30	Special Road Improvement
Coso Ave. and Stoneman Street, between Elsie Street and Shotwell St.	Eaton & Smith	3/6/42			4,983.15		Special Road Improvement Public Assessment
Fitzgerald Ave., between Third St. and Jennings Avenue	Eaton & Smith	10/17/41	6/11/42	100	11,059.63	753.52*	Special Road Improvement Public Assessment
Great Highway Protection near Taraval Street	C. W. Caletti & Company	2/26/41	12/10/41	100	66,455.17	66,455.17	Special Road Improvement Public Assessment
Great Highway Protection Contract No. 2	Love & Haun	2/27/42	5/12/42	100	4,185.24	4,185.24	Spec.Gas Tax Street Improvement General
Lombard Street, from Richardson Avenue to Van Ness Avenue	Chas. L. Harney	9/5/41	6/30/42	24.2	288,096.90	69,813.30	State Highway Trust General

CURRENT CONTRACT DATA 1941-1942

Applying to City Pay Contracts and Major Contracts Involving City Funds

			Completed			Expended	
Description	Contractor	Awarded	Date	%	Amount	to 6/30/42	Fund
		BOULEVARDS, PAVING, GRADING, ETC. - Continued					
Market Street and Clayton Street - Safety Island	Chas. L. Harney	4/25/41	7/24/41	100	$7,655.87	$7,655.87	Spec.Gas Tax Street Improvement
Melrose Avenue and Stillings Avenue, from Congo Street Westerly	Fay Improvement Company	5/15/42			3,544.01		Special Road Improvement
Miguel Street, Beacon Street and Harry St.	Eaton & Smith	11/1/40	6/30/42	76	22,410.79	6,500.00*	Public Assessment County Roads
Oakdale Avenue, between Bayshore Boulevard and Selby Street	Chas. L. Harney	4/17/42			39,714.02		Spec.Gas Tax Street Improvement
Planing Bituminous Pavement Surfaces	Wells The Planer	5/1/42	6/30/42	20.8	33,552.92	6,976.87	Special Road Improvement
Planing Bituminous Pavement Surfaces Contract No. 2	Wells The Planer	5/21/41	9/8/41	100	18,207.77	18,207.77	Spec.Gas Tax Street Improvement
Quintara Street, between 24th Avenue and 26th Avenue	Eaton & Smith	1/26/42			18,349.50		Public Assessment General
Santos Street, between North Line of Velasco St. and a point 275 feet South of Velasco St.	Chas. L. Harney	1/24/41	9/2/41	100	8,115.52	3,550.00*	Public Assessment County Roads

CURRENT CONTRACT DATA 1941-1942

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/42	Fund
			BOULEVARDS, PAVING, GRADING, ETC. - Continued				
State Highway Routes Nos. 2, 55, 56 and 68 Repair of Pavements	Eaton & Smith	6/18/41	11/10/41	100	$7,637.65	$7,637.65	State Highway Trust
Sunnydale Avenue, between Hahn Street and Schwerin Street	Fay Improvement Company	11/7/41	5/29/42	100	20,343.52	8,985.08*	Public Assessment General
Third Street, between Mariposa Street and 23d Street	Chas. L. Harney	4/4/41	2/10/42	100	123,189.72	123,189.72	Spec.Gas Tax Street Improvement
24th Avenue, between Ortega Street and Quintara Street	Chas. L. Harney	3/26/41	1/16/42	100	21,606.83	10,331.70*	Public Assessment County Road
31st Avenue, between Noriega Street and Ortega Street	Chas. L. Harney	11/7/41	6/30/42	100	1,045.93	339.05*	Public Assessment Special Road Improvement
36th Avenue, between Ortega Street and Pacheco Street	Chas. L. Harney	11/12/41	3/27/42	100	11,165.98	4,869.65*	Public Assessment Special Road Improvement
37th Avenue, between Moraga Street and Noriega Street	Fay Improvement Company	10/31/41	3/16/42	100	8,155.12	3,432.99*	Public Assessment County Roads

CURRENT CONTRACT DATA 1941-1942

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/42	Fund
			BOULEVARDS, PAVING, GRADING, ETC. - Continued				
Union Square - Widening and reconstruction of adjoining streets	Fay Improvement Company	4/24/42			$18,752.15		General
Visitacion Avenue Extension, between Hahn Street and Dublin St.	Fay Improvement Company	1/21/42	5/22/42	100	14,983.13	$14,983.13	Spec.Gas Tax Street Improvement
			SEWERS				
Gladstone Drive in Stonecrest - Drain	E. J. Treacy	6/3/42			3,350.00		Special Road Improvement
Jerrold Avenue, between Napoleon Street and Selby Street - Sewer	Walter Lenkeit	1/16/42	6/30/42	66	7,576.00	5,012.00	General
Market Street and Glendale Street - Test pits	Walter Lenkeit	10/31/41	2/9/42	100	1,567.00	1,567.00	Special Road Improvement
Merlin Street, from Harrison Street 417.5 feet southerly - sewer	Fay Improvement Company	1/9/42	3/3/42	100	2,034.45	2,034.45	General
Quesada Avenue, between Quint Street and a point 450 feet easterly - sewer	Fay Improvement Company	11/14/41	1/20/42	100	1,220.85	1,220.85	General
St. Mary's Playground - Test borings and sub-drains	I. B. Tikiob	10/3/41	6/30/42	42	12,234.49	5,070.99	General

CURRENT CONTRACT DATA 1941-1942

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/42	Fund
			BRIDGES				
Fourth St. Bridge, over Channel Street Waterway Repairs, including new Steel Deck Grating	The J. Phillip Murphy Corporation	9/3/41			$27,636.00		Spec.Gas Tax Street Improvement
			MISCELLANEOUS				
Bernal Avenue Slope Repair	Chas. L. Harney	10/18/40	1/2/42	100	13,600.38	$13,600.38	1927 Bernal Bonds
39th Avenue, between Noriega Street and 400 feet southerly - Sand Removal	R. A. Farish	10/3/41	10/31/41	100	2,250.00	2,250.00	County Roads
19th Avenue and Park-Presidio Boulevard - Traffic Signal System Installation	R. Flatland and E. J. Treacy	12/12/41	6/30/42	34	75,000.00	25,640.10	Spec.Gas Tax Street Improvement State Highway Trust

* Amount paid by City, balance by property owners.

CURRENT CONTRACT DATA 1942-1943

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Amount	Expended to 6/30/43	Fund
			Date	%			
			BOULEVARDS, PAVING, GRADING, ETC.				
Chenery St., between 30th & Fairmount Sts.; 30th St. between San Jose Ave. & Chenery St. (Asphaltic concrete wearing surface in track area)	Eaton & Smith	12/11/42	2/8/43	100	$ 2,340.90	$ 2,340.90	General
Coso Ave. & Stoneman Street, between Elsie Street and Shotwell St.	Eaton & Smith	3/6/42	12/30/42	100	4,983.15	1,589.94*	Special Road Improvement Public Assessment
Lombard Street, from Richardson Avenue to Van Ness Avenue	Chas. L. Harney	9/5/41	5/23/43	100	288,096.90	288,096.90	State Highway Trust General
Melrose Avenue and Stillings Avenue, from Congo Street westerly	Fay Improvement Company	5/15/42	10/1/42	100	3,544.01	2,317.64*	Special Road Improvement Public Assessment
Miguel Street, Beacon Street and Harry Street	Eaton & Smith	11/1/40	10/29/42	100	22,410.79	12,084.21*	Public Assessment County Road
Oakdale Ave., between Bayshore Boulevard and Selby Street	Chas. L. Harney	4/17/42	12/29/42	100	39,714.02	39,714.02	Spec.Gas Tax Street Improvement
Ocean Avenue, between Phelan Avenue and San Jose Ave. (Sidewalk)	Love & Haun	6/12/42	7/30/42	100	1,761.40	1,761.40	Special Road Improvement

CURRENT CONTRACT DATA 1942-1943

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed Date	Completed %	Amount	Expended to 6/30/43	Fund
			BOULEVARDS, PAVING, GRADING, ETC. - Continued				
O'Shaughnessy Blvd. & Bosworth St., between Portola Drive and Congo Street	Love & Haun	10/7/42	11/28/42	100	$2,356.20	$2,356.20	General
Planing Bituminous Pavement Surfaces	Wells The Planer	5/1/42	11/13/42	100	33,552.92	33,552.92	Special Road Improvement
Planing Bituminous Pavement Surfaces of Major Streets	Wells The Planer	9/30/42	4/22/43	100	44,832.47	44,832.47	Special Road Improvement
Planing Bituminous Pavement Surfaces of Major Streets - Contract No. 4	Wells The Planer	3/26/43	6/30/43	92.5	18,390.00	17,000.00	Special Gas Tax Street Improvement
Quintara Street, between 24th Avenue and 26th Avenue	Eaton & Smith	1/26/42	12/7/42	100	18,349.50	11,716.59*	General, Public Assessment
Union Square - Widening and Reconstruction of adjoining streets	Fay Improvement Company	4/24/42	10/5/42	100	18,752.15	18,752.15	General
Visitacion Avenue, between Hahn Street and Schwerin Street	Fay Improvement Company	4/14/42	1/12/43	100	25,282.07	14,503.16*	Public Assessment, Spec.Gas Tax Street Improvement

CURRENT CONTRACT DATA 1942-1943

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Amount	Expended to 6/30/43	Fund
			Date	%			
			SEWERS				
Arlington St. North of St. Mary's Avenue (Drainage System)	Eaton & Smith	1/29/43	4/12/43	100	$16,981.96	$16,981.96	Special Road Improvement
Burnham St. & 24th St. (Drainage System)	R. Flatland	2/26/43	6/30/43	100	18,485.04	18,485.04	Special Road Improvement
Gladstone Drive in Stonecrest (Drain)	E. J. Treacy	6/3/42	11/9/42	100	3,350.00	3,350.00	Special Road Improvement
Hyde Street (Extension of Storm Drain Outfall)	E. J. Treacy	5/5/43			3,650.00		General
Jackson St., between Battery St. & Sansome St. (5' Circ. sewer)	M. J. Lynch	2/5/43	6/30/43	100	39,679.01	39,679.01	General
Jerrold Ave., between Napoleon St. and Selby St. (Sewer)	Walter Lenkeit	1/16/42	8/1/42	100	7,576.00	7,576.00	General
Justin Drive & College Ave. to Alemany Blvd. (Storm Overflow Drain)	Fay Improvement Company	10/2/42	3/12/43	100	3,625.50	3,625.50	General
Lucerne St. from Brannan St., 268 feet southerly (Sewer)	Fay Improvement Company	3/3/43	5/13/43	100	2,260.28	2,260.28	General

CURRENT CONTRACT DATA 1942-1943

Applying to City Pay Contracts and Major Contracts Involving City Funds

Description	Contractor	Awarded	Completed		Amount	Expended to 6/30/43	Fund
			Date	%			
			SEWERS - Continued				
Market St. and Glendale St. (Intercepting Drain)	Walker Lenkeit	8/14/42	1/13/43	100	$5,126.40	$5,126.40	Spec.Gas Tax Street Improvement
St. Mary's Playground (Test Borings and Sub-drains)	I. P. Tikiob	10/1/42	12/17/42	100	12,234.49	12,234.49	General
Sigmund Stern Grove Near 19th Ave. and Sloat Blvd. (Sewer replacement)	E. J. Treacy	2/17/43	4/22/43	100	1,474.00	1,474.00	General
Sloat Blvd., from 45th Avenue to Great Highway (Drainage Improvement)	Chas. L. Harney	10/30/42	3/18/43	100	1,711.69	1,711.69	General
			BRIDGES				
Third St. Bridge, over Channel St. Waterway (Repairs to North Fender)	Healy Tibbets Construction Co.	3/12/43	4/14/43	100	1,104.80	1,104.80	Spec.Gas Tax Street Improvement
Third St. Bridge, over Channel St. Waterway (New Timber Deck)	Eaton & Smith	12/18/42	6/19/43	100	28,267.00	28,267.00	Spec.Gas Tax Street Improvement
Fourth St. Bridge (Repairs and alterations to main pinion bearing)	Pelton Water Wheel Co.	4/16/43	5/14/43	100	3,310.01	3,310.01	Spec.Gas Tax Street Improvement

CURRENT CONTRACT DATA 1942-1943

Applying to City Pay Contracts and Major Contracts Involving City Funds

			Completed			Expended	
Description	Contractor	Awarded	Date	%	Amount	to 6/30/43	Fund
			BRIDGES - Continued				
Fourth St. Bridge, over Channel St. Waterway (Repairs, including new Steel Deck Grating)	The J. Phillip Murphy Corp.	9/3/41	8/30/43	100	$27,708.48	$27,708.48	Spec.Gas Tax Street Improvement
Sixth Street Bridge (Deckwork and Painting)	M. J. Lynch	7/1/42	1/8/43	100	9,893.84	9,893.84	Spec.Gas Tax Street Improvement
			MISCELLANEOUS				
Air Raid Sirens (Installation)	Empire Construction Co., Ltd.	3/3/43	6/19/43	100	5,920.70	5,920.70	General
Bayshore Boulevard and Leland Avenue (Traffic Islands)	M. J. Lynch	7/24/42	11/21/42	100	2,475.00	2,475.00	State Highway Trust
Clarendon Avenue Yard (Repairs and Cleanup)	DeLuca & Son	2/19/43	6/15/43	100	995.00	995.00	General
19th Avenue and Park-Presidio Boulevard (Traffic Signal System Installation)	R. Flatland and E. J. Treacy	12/12/41	11/3/42	100	48,724.30	48,724.30	Spec.Gas Tax Street Improvement, State Highway Trust
Traffic Beacons (Blackout Control)	R. Flatland	10/16/42	5/3/43	100	2,585.00	2,585.00	Spec.Gas Tax Street Improvement

* Amount paid by City, balance by property owners.

INFORMAL CONTRACTS

COMPLETED DURING FISCAL YEAR 1941-1942

Location	Type of Work	Amount	Fund
Alemany Boulevard at Trumbull Street	Relocation of lighting standard	$195	Boulevard Bonds 1927
Arlington St., between St. Mary's Avenue and Miguel Street	Test borings	248	General
Bernal Avenue, east side South Richland Avenue	Test borings	352	Special Road Improvement
Bernal Avenue, westerly side, north of Mateo St.	Test borings	901	Bernal Cut Bonds
Bernal Heights, Twin Peaks, etc.	Wire fences for air raid sirens	1,236	General
Castenada Avenue and Ventura Avenue	Drains	768	General
First Street and Bryant Street, intersection	Grading and removal of debris	340	Special Road Improvement
Forty-second Avenue between Taraval Street and Ulloa Street	Sand removal	737	Special Road Improvement
Great Highway and Lincoln Way	Test borings	244	General
Hyde Street, north of Jefferson Street	Sewer outfall extension	944	General
Junipero Serra Boulevard for Stanley Street Underpass	Test borings	580	Spec.Gas Tax Street Improvement
Lombard Street Widening	Removal of buildings	1,756	State Highway Trust
Nineteenth Avenue at the San Francisco State College	Storm drain	943	General
Phelan Avenue, Judson Avenue, southerly	Sidewalk	698	Special Road Improvement
Richmond-Sunset Sewage Treatment Plant	Steel Gratings - clean and galvanize	383	General
Seacliff	Storm Overflow Sewer	627	General

INFORMAL CONTRACTS - Continued

Location	Type of Work	Amount	Fund
Stonecrest Subdivision	Test borings	$183	Special Road Improvement
Sunset Boulevard adjacent to Fleishhacker Playfield	Drain	970	General
Third Street Bridge over Channel Street Waterway	Cleaning and painting (portions)	696	Spec.Gas Tax Street Improvement
Thirty-ninth Avenue, north of Ortega Street	Sand Removal	476	County Road
Tucker Avenue, between Delta and Rutland Streets	Sidewalk	276	Special Road Improvement
Union Street, between Montgomery and Calhoun Streets	Minor Improvements	385	County Road

COMPLETED DURING FISCAL YEAR 1942-1943

Location	Type of Work	Amount	Fund
Arlington Street and Burnham Street	Drain shafts	$970	Special Road Improvement
Blueprinting Department	Tile work	293	General
Bosworth St. adjacent to Glen Park Playground	Sidewalk	610	Special Road Improvement
Burnham Street near 24th Street	Test borings	642	General
Cayuga Avenue, between Junior Terrace and Seneca Street	Sewer replacement	935	General
Filbert St. stairway east of Kearny Street	Hand rails installed	385	Special Road Improvement
Great Highway, north of Lincoln Way	Sand removal	3,060	Special Road Improvement
Mission Street, between Virginia Ave. and 29th Street	Reconstruction of roadway	983	Special Road Improvement
O'Shaughnessy Boulevard between Del Vale Ave. and Bosworth Street	Slide Removal	903	Street repair
Third Street Bridge	Fender repairs	857	Spec. Gas Tax Street Improvement

DIVISION OF DESIGN

This division investigates and prepares reports on all proposed major projects, including preliminary designs and estimates of cost. When a decision has been reached to proceed with a project, for which money is available, this division prepares all plans and specifications for construction contracts.

Studies and investigations on some projects continue over several years, because the necessary funds for construction are not available, or because other projects of greater importance take precedence.

The work done by this division is divided into two groups. One group includes those projects which were complete. The other group includes projects on which work was done but completion of which will be deferred until a later date. It will be noted that the report of this division refers to investigations, studies, plans and specifications only, and not to construction.

DIVISION OF DESIGN

Fiscal Year 1941-1942

(These items refer to plans and specifications and not to actual construction)

	APPROXIMATE COST		
Major Divisions	Plans and Specifications Complete	Plans and Specifications Under Way	Plans and Surveys Only
Boulevards (1927 Bonds)	$	$ 66,011	$
Bridges - Second one-quarter cent gasoline tax			
Estimates, Investigations and Reports			
Maps			
Miscellaneous Plans (County Roads)			7,185
Sewers (1928 Bonds)			2,206
Sewers, Extensions and Pumping Stations			
One-quarter cent Gasoline Tax - State Highways	14,552	257,875	24,000
One-quarter cent Gasoline Tax - Major Streets	236,396	7,462,400	59,041
Special Improvements (County Roads)			18,126
Tax Rate Plans	291,500	115,400	33,103
Traffic Engineering Section			23,581
	$542,448	$7,835,675	$167,242

DIVISION OF DESIGN

Fiscal Year 1942-1943

(These items refer to plans and specifications and not to actual construction)

	APPROXIMATE COST		
Major Divisions	Plans and Specifications Complete	Plans and Specifications Under Way	Plans and Surveys Only
Boulevards (1927 Bonds)	$	$ 66,011	$
Bridges - Second one-quarter cent gasoline tax			
Estimates, Investigations and Reports			
Maps			
Miscellaneous Plans (County Roads)			
Sewers, Extensions and Pumping Stations			
One-quarter cent Gasoline Tax - State Highways	904	441,700	23,000
One-quarter cent Gasoline Tax - Major Streets	525,877	6,214,000	263,096
Special Improvements (County Roads)			5,327
Tax Rate Plans			42,370
Traffic Engineering Section			16,372
Sewers (1928 Bonds)			77
	$526,781	$6,721,711	$350,242

DIVISION OF DESIGN
Fiscal Year 1941-1942

These items refer to plans and specifications and not to actual construction.

BOULEVARDS, STREETS AND HIGHWAYS	Contract Plans Complete	Contract Plans Under Way	Lands (Estimated)	Plans and Surveys only
Alemany Blvd.-Sec. A Bayshore Blvd. - Mission Street	$	$ 66,011	$	$
STATE HIGHWAYS (One-Quarter Cent Gasoline Tax)				
Lombard Street Signal System	11,448	20,875		
Bayshore Blvd. and Potrero Avenue - Channelization	2,475	117,000		
Alemany Blvd. - San Jose to Mission St. Channelization		46,000		
Mission St. Viaduct		62,000		
Alemany Blvd. at St. Mary's Park - Overpass		12,000		
Potrero Ave. at 25th Street - Underpass				1,000
Junipero Serra Blvd. at Alemany Blvd. - Grade Separation				5,000
Junipero Serra Blvd. at Stanley Drive - Underpass				10,000
Bayshore Blvd. - Van Ness Ave. - Lombard St. - Grade Separations, etc.				8,000
Traffic Striping, Rt. #56	107			
#2	302			
#68	220			
MAJOR STREETS (One-Quarter Cent Gasoline Tax)				
Market St.-Portola Dr.	30,000	2,038,000	51,000	2,938

MAJOR STREETS (Continued)	Contract Complete	Plans Under Way	Lands (Estimated)	Plans and Surveys only
Third St. Widening	$126,074	$ 600,000	$268,000	$ 36,499
Army St. Widening	30,398	80,000	270,000	939
Traffic Striping				2,700
Clipper St. Extension		125,000	20,000	1,477
Islais Creek Bridge-New		1,200,000		924
Sixth Street - Brannan St. to 3d St.		2,465,000	535,000	1,222
13th St. - Mission St. to Bryant St.		81,000	316,000	513
Fourth Street'- Bridge Repairs				397
Miscellaneous - Structures, Repairs	1,579			185
Evans Avenue Bridge-New		54,600		696
Great Highway Studies	4,995			2,450
Marina Boulevard - Lyon St. to Laguna St.	10,794		6,000	638
Stanley Drive - Alemany Boulevard to Junipero Serra Blvd.		130,000	20,000	117
Stanley Drive - Underpass	611	206,000		210
Trumbull Street		60,000	50,000	240
Sunset Boulevard - Crossing Golden Gate Park		236,000		180
Bryant Street - Division St. to Army St. (W.P.A.)	19,500		22,000	1,206
Geneva Avenue Extension		28,000	62,000	485
Anza St. Studies		80,000	9,000	802
19th Ave. Signals		78,800		3,887
Sixth St. Bridge	9,445			193
Dolores Street - South of 30th Street	3,000			143

SEWERS, SEWAGE PUMPING STATIONS, RICHMOND-SUNSET TREATMENT PLANT	Contract Complete	Plans Under Way	Lands (Estimated)	Plans and Surveys only
Miscellaneous Sewer Extensions	$	$		$ 3,512
Richmond-Sunset Sewage Treatment Plant				5,836
Sewage Pumping Stations				1,035
Sewage Replacements:				
State Highway and Major Streets - General Engineering				870
Third St. Widening				1,567
Army Street				1,072
Storm and Sanitary Sewers General Engineering				5,535
Great Highway Sewer System	192,600			5,812
Ingleside Terraces Sewer System		64,500		2,470
15th and Church Sts. Sewer System	98,900			4,047
27th and Church Sts. Sewer System		50,900		1,347
14th St., 15th St., Harrison St., Market St. Sewer Extension (1928 bonds)				2,206
ESTIMATES, INVESTIGATIONS AND REPORTS				
Civilian Defense				
Fire Department Standards				
Foerster Street Slide				
Holly Park Firehouse				
Lighting Survey C.A.O. Civil Service				
Log Cabin Ranch				
Police Pistol Range				
St. Mary's Playground				

SPECIAL IMPROVEMENTS County Roads	Plans and Surveys Only
Christmas Tree Point	$ 4,367
Work in front of City Property	612
Work in front of City Property (Borings, Geologist, Inspection)	2,206
Engineering Studies for which no Special Appropriations had been made:	18,126

- Aquatic Park - Beach Formation
- Bayshore Highway - Pedestrian Overpass
- Bernal Avenue Drains
- Bernal Avenue Extension
- California Street and Cornwall Street
- First Street and Bryant Street
- Gladstone Drive (in Stonecrest) Drains
- Hearst Monastery Fencing
- Hunters Point - Temporary Roads
- Lyon Warehouse Reconstruction
- Market Street - Basement Street (Proposed)
- Market Street - Gough Street to Castro Street
- Market Street and Morgan Alley Slide
- Monterey Boulevard, Bernal Avenue, and San Jose Ave.
- Public Works Reserve
- 17th Street, Market Street, and Castro Street
- Stanley Drive to South of Knowles Avenue
- Villa Terrace
- Wolfe Street, Mullen Avenue, and Peralta Avenue

MAPPING	
Underground Structures	Under Way

DIVISION OF DESIGN
Fiscal Year 1942-1943

These items refer to plans and specifications and not to actual construction.

BOULEVARDS, STREETS AND HIGHWAYS	Contract Plans		Lands (Estimated)	Plans and Surveys only
	Complete	Under Way		
Alemany Boulevard Section A, Bayshore Blvd. - Mission St.	$	$ 66,011	$	$
STATE HIGHWAYS (One-Quarter Cent Gasoline Tax				
Bayshore Boulevard and Potrero Avenue Channelization		241,500		
Alemany Boulevard - San Jose to Mission St. Channelization		111,500		
Mission Street Viaduct		62,000		
Alemany Boulevard at St. Mary's Park Overpass		26,711		
Junipero Serra Blvd. Alemany Boulevard - Underpass				5,000
Junipero Serra Blvd. at Stanley Drive - Underpass				10,000
Bayshore Boulevard - Van Ness Avenue, Lombard St. - Grade separations, etc.				8,000
Traffic Striping				
Route #56	107			
Route #2	311			
Route #55	74			
Route #68	412			
MAJOR STREETS (One-Quarter Cent Gasoline Tax)				
Market St.-Portola Dr.	30,000	3,385,000	3,140,000	195,000
Third Street Widening	326,074	400,000	268,000	36,499
Army Street Widening	30,398	139,000	543,000	939

MAJOR STREETS (Continued)	Contract Complete	Plans Under Way	Lands (Estimated)	Plans and Surveys only
Traffic Striping	$	$	$	$ 2,039
Clipper St. Extension		125,000	20,000	1,477
6th Street, Brannan St. to 3d Street		1,600,000	535,000	1,222
Great Highway Studies	73,000			433
San Jose Avenue, Army St. to Brook St.		107,000	500,000	650
Marina Boulevard, Lyon St. to Laguna St.	10,794		6,000	300
Stanley Drive, Alemany Blvd. to Junipero Serra		130,000	20,000	2,439
Stanley Drive Underpass	611	206,000		458
Monterey Blvd., Ridgewood Ave. to San Anselmo Avenue				267
Anza St. Studies		80,000	9,000	3,428
19th Ave. Signals	55,000	42,000		1,795
3d St. Bridge - Steel Deck				242
3d Street - Custer Avenue to Bayshore Blvd.				4,209
Junipero Serra Blvd. - Ocean Ave. to 19th Ave.				1,313
Market St., Gough St., Castro St. and 17th St.				670
Maintenance and Repairs				300
Hunters Point Boulevard Extension				49
Channelization for Traffic and Safety				5,306
Maintenance of Bridges				1,378
Alemany Blvd., San Jose Ave. to Junipero Serra Boulevard				1,017
Bernal Avenue Maintenance East Side				742

MAJOR STREETS (Continued)	Contract Plans Complete	Contract Plans Under Way	Lands (Estimated)	Plans and Surveys only
Market Street and Portola Drive - Maintenance				$ 657
Miscellaneous Repairs - Structures				267
SEWERS AND SEWAGE PUMPING STATIONS				
Miscellaneous Sewer Extension				2,676
Sewage Pumping Stations				873
Storm and Sanitary Sewers				19,945
Sewage Pumping Stations and Disposal Plants				18,876
ESTIMATES, INVESTIGATIONS AND REPORTS				
Air Raid Sirens				
Aquatic Park Groins				
Black-out Control for Beacons				
Board of Education - Glass Protection				
Fire Department Standards				
Police Pistol Range				
SPECIAL IMPROVEMENTS County Roads				
Work in front of City Property				25
Engineering Studies for which no special appropriations had been made				5,327
MAPPING				
Underground Structures				Under Way

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